

5. Marsh Hawks showed too high a percentage of serious injuries to warrant taking them in padded steel traps. Most of the damage was believed to be due to the struggles of the bird against the heavy trap and not to the impact of the trap when sprung. For this reason the injuries may be greatly alleviated where it is possible to attend the traps closely. I feel certain that many of the injuries could be eliminated if a much lighter trap could be made without reducing the spread of the jaws. Such a trap would offer less resistance to the movements of the bird and decreases the harm done by its floundering after it is caught. Some method of keeping the smaller birds out of traps set for large hawks is necessary. This might be done by the use of springs or sponge-rubber pads under the trap pans. Some trap companies are working now to develop a steel trap for birds that will be both selective and harmless. The chain foothold trap is being extensively tested to find means of improving it. This work may soon produce the bird trap that we have been looking for—one that is effective as well as humane, and one that is ready to use when purchased.

NOTES ON HIPPOBOSCID FLIES¹

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WHILE making a survey of the relative prevalence of blood parasites in our native birds at the Austin Ornithological Research Station on Cape Cod (Herman, 1938), numerous hippoboscid flies were observed. Certain of the larger species of these bird flies have been shown to transmit *Hæmoproteus*—a common malaria parasite of avian red blood cells. None of the smaller flies nor the infections of birds other than domestic pigeons, doves, and quail have been extensively studied. An effort has, therefore, been made to collect a number of the flies and to determine whether any relationship exists between the occurrence of these ectoparasites and the endoparasites of the blood. The present paper is mainly a list of the hosts which have been found infested with these flies at the Austin Station, with a few added remarks on their relative abundance on different species of birds and the rôle they may play in the spread of parasites among the avifauna. The author is indebted to Dr. J. Bequaert of the Department of Tropical Medicine, Harvard University Medical School, for suggestions and encouragement and for verifying the identification of a number of the flies.

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The birds to be examined were taken into the laboratory for the purpose of making blood smears. At this time the bird was held for a brief period in front of a closed window while its feathers were ruffled vigorously. The flies thus flushed fly to the window, where they are easily captured in small vials. This method was first suggested by Mr. C. L. Whittle (Peters, 1930) and has proved to be the most satisfactory means of collecting them.

Two species of flies occur commonly on the Passeriform birds: *Ornithoica confluenta* and *Ornithomyia anchineuria*. They are unable to exist for very long when removed from a bird; the smaller species (*O. confluenta*) dies usually within forty-eight hours; the larger species may survive seventy-two hours (one fly remained alive in a gauze-covered vial for five days).

ORNITHOICA CONFLUENTA SAY

Ornithoica confluenta Say is a small fly which varies approximately from 2 to 2.5 mm. in length. It is characterized mainly by the fact that the third vein of the wing becomes confluent with the costal vein on the apical third (see Johnson, 1922). The following is a list of the host species from which this fly has been captured at the Austin Station:

FAMILY COLUMBIDÆ

Eastern Mourning Dove, *Zenaidura macroura carolinensis*.

FAMILY TYRANNIDÆ

Eastern Kingbird, *Tyrannus tyrannus*.

FAMILY MIMIDÆ

Catbird, *Dumetella carolinensis*.

FAMILY COMPSOTHELYPIDÆ

Northern Pine Warbler, *Dendroica p. pinus*

Northern Yellowthroat, *Geothlypis trichas brachidactyla*

FAMILY ICTERIDÆ

Eastern Red-wing, *Agelaius p. phæniceus*

Eastern Cowbird, *Molothrus a. ater*

FAMILY FRINGILLIDÆ

Red-eyed Towhee, *Pipilo e. erythrophthalmus*

Eastern Savannah Sparrow, *Passerculus sandwichensis savanna*

Eastern Grasshopper Sparrow, *Ammodramus savannarum australis*

Eastern Vesper Sparrow, *Poæcetes g. gramineus*

Eastern Chipping Sparrow, *Spizella p. passerina*

Eastern Field Sparrow, *Spizella p. pusilla*

Swamp Sparrow, *Melospiza georgiana*

Eastern Song Sparrow, *Melospiza m. melodia*

Specimens of this species of fly were collected by Mr. C. L. Whittle in Peterboro, New Hampshire, from Song Sparrows and from a White-throated Sparrow (*Zonotrichia albicollis*) and sent to the

author during the summer of 1936. None of the latter species have been examined for parasites at the Austin Station.

The above list gives no inkling of the abundance of this fly. With one exception, all the birds parasitized at the Austin Station were Passeriforms. Although over one hundred Mourning Doves have been carefully examined during the past two summers, only four of these birds have been found infested, three with one fly each and one bird with three flies. Only one Kingbird has been examined and it was found to be parasitized with three of these flies and one specimen of *O. anchineuria*. The most abundantly infected are the various Fringillids, particularly the Song Sparrows—individuals of which may commonly support six to eight flies. However, Cowbirds and Red-wings are also heavily parasitized, and the greatest number of *O. confluenta* taken from a single bird was 19 from a Red-wing.

ORNITHOMYIA ANCHINEURIA SPEISER

This species is about twice as large as *O. confluenta*. The body of this fly may be either brown or dark green in color. At the Austin Station it is the most common parasite on the Passeriform birds and has been taken from the following hosts:

FAMILY ACCIPITRIDÆ

Marsh Hawk, *Circus hudsonius*

FAMILY TYRANNIDÆ

Eastern Kingbird, *Tyrannus tyrannus*

FAMILY PARIDÆ

Black-capped Chickadee, *Penthestes a. atricapillus*

FAMILY MIMIDÆ

Catbird, *Dumetella carolinensis*

FAMILY TURDIDÆ

Eastern Robin, *Turdus m. migratorius*

Eastern Bluebird, *Sialia s. sialis*

FAMILY COMPSOTHLYPIDÆ

Eastern Yellow Warbler, *Dendroica a. æstiva*

Northern Pine Warbler, *Dendroica p. pinus*

Northern Yellow-throat, *Geothlypis trichas brachidactyla*

FAMILY ICTERIDÆ

Eastern Red-wing, *Agelaius p. phæniceus*

Eastern Cowbird, *Molothrus a. ater*

FAMILY FRINGILLIDÆ

Red-eyed Towhee, *Pipilo e. erythrophthalmus*

Eastern Savannah Sparrow, *Passerculus sandwichensis savanna*

Eastern Grasshopper Sparrow, *Ammodramus savannarum australis*

Eastern Vesper Sparrow, *Poæcetes g. gramineus*

Eastern Chipping Sparrow, *Spizella p. passerina*

Eastern Field Sparrow, *Spizella p. pusilla*

Eastern Song Sparrow, *Melospiza m. melodia*

Ornithomyia anchineuria occurs most abundantly on the Cowbirds at the Austin Station. As many as twenty-three of this species have been observed to fly from a single Cowbird, and between ten and twenty is common. In fact, during the month of August a Cowbird without at least one of these flies is indeed rare. It occurs nearly as abundantly on the Red-wings.

Adult birds are infested as well as the immature birds. Only in one case were hippoboscids observed on nestlings. In 1936 two Cowbirds removed from a Chickadee nest were parasitized with two of the flies apiece. The adult Chickadee was captured on its nest a few days later and a single fly was taken from its feathers. Although a number of Chickadees have been examined, this was the only one infected with hippoboscid flies. It therefore seems probable that the Chickadee is an abnormal host and that the bird found infected obtained its infestation through the parasitic nesting habit of the Cowbird. Although a great number of nestling Red-wings were carefully examined, no flies were observed on these birds.

LYNCHIA AMERICANA (LEACH)

This fly is much larger than the preceding species and has been taken mainly from hawks and owls. At the Austin Station two specimens were obtained in 1936 and two in 1937 from the following hosts:

Broad-winged Hawk, *Buteo p. platypterus*
Great Horned Owl, *Bubo v. virginianus*

LYNCHIA ALBIPENNIS SAY

Only one specimen of this species has been taken from a bird at the Austin Station. This was collected in 1933 by Dr. O. L. Austin, Jr., from an adult Black-crowned Night Heron, (*Nycticorax nycticorax hoactli*).

PREVALENCE

Ornithomyia anchineuria is by far the most common fly on the birds at the Austin Station. It has been observed on both adult and young birds but is much more numerous on the younger birds. Cowbirds and Red-wings are much more heavily parasitized than any of the other species of birds. *O. confluenta* is most abundant on the Song Sparrows but occurs on the other Fringillids, Cowbirds, and Red-wings quite frequently. The flies have been taken as early as June 6th and as late as September 15th but are most abundant in the last week in July and during the month of August. During August, 1937, the hippoboscids were much more numerous than they had been at the same time in 1936. Mr. Whittle informs me that the reverse has been true with the birds he has trapped in Peterboro, New Hampshire. In 1937 there was practically no rain

during July on Cape Cod, while in New Hampshire there was more rain in July, 1937, than there was the previous year. Perhaps the hippoboscid flies thrive better in a drier atmosphere.

PHORESIS

A number of investigators have suggested that hippoboscid flies may serve to disseminate other ectoparasites among the birds. Several cases have been reported of hippoboscids with Mallophaga attached to their abdomens, as evidence that these flies serve to spread the feather lice among the avifauna. Of a great number of flies collected and carefully examined at the Austin Station only one (Herman, 1937) has carried Mallophaga. It can therefore be concluded that hippoboscids are not an important factor, at least on Cape Cod, in the dissemination of bird lice.

PARASITISM

Some of the hippoboscids collected from birds at the Austin Station have been parasitized by sarcoptid mites. This family of mites are characteristically ectoparasites of mammals, but a single subfamily—*Myialgesina*—has been reported as parasites of hippoboscid flies. They were first described from a fly collected in Africa by Sargent and Trouessart in 1907. They have been reported from this country in California by Ferris (1928), who observed the mites on *Ornithoica confluenta* and also on flies collected in the Philippine Islands. At the Austin Station these mites have been observed on both *Ornithoica confluenta* and *Ornithomyia anchineuria*. They have been most abundant on *Ornithomyia anchineuria* collected from Cowbirds, but also have occurred infrequently on both species of hippoboscids collected from other birds.

There is a question as to whether these mites are true parasites of the hippoboscids or are merely using the flies in a phoresic nature, as is the case with the Mallophaga. However, they have been reported only from hippoboscid flies and are not known to parasitize birds. Ferris pointed out that the mites leave a scar when removed from a fly. Nothing further is known of the biology of these mites. At the Austin Station they did not appear on the flies until late in August. The hippoboscids are much less abundant in September, but whether the parasitic mites have anything to do with the reduction is not known.

SUMMARY

Ornithoica confluenta is reported from fifteen species of birds at the Austin Ornithological Research Station and was observed to occur most frequently on Song Sparrows and other Fringillids. *Ornithomyia anchineuria* is listed from eighteen species of birds. It is very common on Cowbirds and Red-wings. Two species of

birds were found to be parasitized by *Lynchia americana*, and one specimen of *Lynchia albipennis* was collected from a Black-crowned Night Heron. Hippoboscids were found to be most prevalent on the Cowbirds. Both adult and young birds are infested. The flies are most abundant during late July and the month of August. It is suggested that the hippoboscids thrive best in a dry atmosphere.

Mallophaga were observed on only one hippoboscid of a great many examined. It is therefore concluded that phoresy as a means of dissemination of ectoparasites of birds by hippoboscids is not an important factor on Cape Cod. Parasitic sarcoptid mites of the subfamily *Myialgesinæ* are reported from *Ornithoica confluenta* and *Ornithomyia anchineuria*.

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WEIGHTS OF SOME BIRDS OF PREY OF WESTERN KANSAS

By RALPH H. IMLER

Introduction

LOCALITY. The following weight records of 112 birds from Rooks County, Kansas, were obtained during fall and winter months from September, 1935, to February, 1937. Most of the data are from live birds that were trapped for banding but some records are from specimens collected for study skins or found dead along the roadside by students of the Stockton (Kansas) High School. Dead birds were weighed only if in fresh condition.

TECHNIQUE. Spring balance scales of 2000 gram capacity were used for taking most of the weights. The eagles and the largest hawks were weighed on a Chatillon milk scale which was read to the nearest one-twentieth pound, and the readings were computed in grams. Sparrow Hawks and small owls were weighed on platform balances. All scales used were regularly tested for accuracy.