

SOME NOTES ON CERTAIN OF THE HIPPOBOSCID
FLIES

By CHARLES W. JOHNSON

For several years Mr. Charles L. Whittle in his work of banding birds has found that it is seemingly only the juvenile birds (the young of the year) and not the adult birds that are infested by Hippoboscid flies, and he wants to know how general this is and if the presence of the flies can always be depended upon as indicating a juvenile bird. This seemed such an interesting feature connected with the life of these flies, that it warranted further consideration and a careful investigation. Mr. A. W. Higgins also informs me that it is usually the juvenile birds from which he takes the bird flies.

The first species to consider is the common bird fly, *Ornithomyia anchincuria* Speiser (*pallida* Say), considered by Professor G. F. Ferris to be the same as the European species *Ornithomyia auricularia* Linn. In going over the collections I was surprised to find that of some fifty records all referred to specimens taken between July 9th and September 28th. All of these specimens were from New England except one from Pennsylvania dated October 19th. It seemed strange that from all the birds shot during spring migration for museum specimens, no flies were apparently taken, especially since I have been making a special effort the past few years to secure the flies at all seasons.

The following records of *Ornithomyia anchincuria* and their hosts are from the collections in the Museum of the Boston Society of Natural History and the Museum of Comparative Zoölogy.

- Peterboro, N. H., Aug. 8, 16, and 23, 5 specimens from a Chipping Sparrow (C. L. Whittle)
- Rock, Mass., Aug. 17, 12 specimens from a Chipping Sparrow (A. W. Higgins)
- Colmasset, Mass., Sept. 7, from a Chipping Sparrow (L. B. Fletcher)
- Wells River, Vt., Sept. 10, from a Chipping Sparrow (W. P. Smith)
- Rock, Mass., July 3, 6 specimens from a Song Sparrow (A. W. Smith)
- Concord, Mass., July 9, from a Song Sparrow (E. B. White)
- Martha's Vineyard, Mass., July 16, 2 specimens from a Song Sparrow (Sidney Harris)
- Wells River, Vt., July 30, from a Song Sparrow (W. P. Smith)
- Peterboro, N. H., Aug. 17, from a Song Sparrow (C. L. Whittle)
- Essex, Mass., Aug. 29, 2 specimens from a Savanna Sparrow (A. B. Fuller)
- Athol, Mass., Aug. 15, from a Purple Finch (Robert Allison)

- Woodstock, Vt., Aug., 1911, from a Junco (juvenile) (A. P. Morse)
 Soldier Pond, Me., Sept. 28, 1928, from a Junco (E. O. Grant)
 Martha's Vineyard, Mass., Sept. 22, from a Towhee (Sidney Harris)
 Wellesley, Mass., July 27, from a Rose-breasted Grosbeak (Mrs. H. C. Dunham)
 North Bay, Ontario, Sept. 7, from a Red Crossbill (G. S. Miller)
 Needham, Mass., July 10, from a Cowbird (J. D. Smith)
 Philadelphia, Pa., Sept. 2 and 9, from a Bobolink (Charles Liebeck)
 Philadelphia, Pa., August 19 and 20, from a Red-winged Blackbird (Charles Liebeck)
 Southbridge, Mass., Aug. 18, from a Robin (S. W. Bromley)
 Clifton, Pa., Oct. 19, from a Hermit Thrush (C. A. Voelker)
 Worthington, Mass., August, from a Catbird
 Hollbrook, Mass., Sept. 1, from Brown Thrasher (J. D. Smith)
 Peterboro, N. H., July 12, from Downy Woodpecker (Mrs. C. L. Whittle)
 Ellis Bay, Anticosti Island, Quebec, Sept. 3, from a Barbour's Jay (W. S. Brooks)

The greatest number from a single sparrow was four, taken by Mrs. C. L. Whittle from Chipping Sparrow, August 23, 1925.

The flies must be on the parent birds for it is apparently the only way in which they could reach the young birds. It is known that the flies of this species drop their pupae in the nests of their hosts, therefore when the flies emerge they would naturally go on the young birds, while the parent flies after depositing their pupae would probably die. It is not a case as among other Diptera (the *Protocalliphora* for example) of the fly depositing its eggs in a place suitable for its larvae, but of placing its pupae where the fly when it emerges can readily reach its host. The flies are not prolific and only a single pupa is brought forth at a time, and not more than two pupae are produced. It is said that they remain in the pupae but a short time. This would be in accord with the life of the fly, for, living practically its entire life on the warm body of its host and protected by the feathers, its pupae would be unable to withstand any great degree of cold.

Their abundance at the close of the breeding-season on their hosts, clearly indicates that this is the time when the flies reproduce in greatest numbers, and the small size of the abdomen of most of the flies on the young birds would indicate that they had recently emerged. Among these flies, however, are some matured adults or those containing pupae, and that they also probably drop their pupae among the feathers of the birds is indicated in the case of a fly taken from a Savannah Sparrow, August 29th, by Mr. A. B. Fuller, the fly dropping her pupae in his hand. The depositing of pupae among the feathers of its host seems to be habit of *Ornithoica confluenta*. One large

bird fly, *Lynchia americana*, taken from a Ruffed Grouse, October 9th, by Mr. J. D. Smith deposited a pupa in his hand.

Some species of birds seem to harbor more flies than others. Mr. J. D. Smith on July 10th shot two fledgling Cowbirds and one moulting adult. From each of the fledglings there darted from six to eight flies, and from the adult two. Is this just a coincidence or do Cowbirds have more flies than other species and act as carriers and disseminate the flies in visiting the nests of other birds? Perhaps it is only a case where the young Cowbirds are more attractive to the flies than are other fledglings.

The foregoing list shows that most of the records are from the smaller songbirds that migrate to the south in winter. In regard to attempting to find this fly in winter, Mr. Whittle sent out a number of inquiries. Professor F. A. Saunders reported banding at South Hadley, Massachusetts, last season (1928) between Feb. 8th and about May 14th, 400 Purple Finches and 88 Tree Sparrows, plus 68 other species. He searched carefully for parasites but failed to find a single fly. Mr. Whittle says, "I have never taken a fly in winter, although I have banded hundreds of Purple Finches, etc." Similar reports were received from Mr. S. Prentiss Baldwin, Dr. John B. May, and Mr. T. E. Musselman.

From the above observations the following summary is presented: that this fly, *Ornithomyia anchineuria*, is confined to the strictly migratory species (its occurrence on other birds being accidental); that they must be on these birds on their return in the spring; that the fly probably reproduces only in the summer and early autumn, usually depositing its pupa in the nest of its host. The fly on emerging from the pupa naturally seeks the fledglings and is slow in deserting a young for an adult bird. The parent flies which were on the adult birds probably die after depositing at most two pupae.

The little bird fly *Ornithoeca confluenta* Say is considered by some to be almost cosmopolitan in distribution but the standing of the species need not be referred to here as the remarks are all based on New England material. This fly seems to frequent all sorts of birds and appears in greatest numbers at about the same time as the preceding species, as indicated by the following list of records:

- Peterboro, N. H., Aug. 11, 16, 18, 19, 20, 23, and Sept., 15 specimens from a Song Sparrow (C. L. Whittle).
- Rock, Mass., Aug. 17, from a Chipping Sparrow (A. W. Higgins).
- Wellesley, Mass., July 27, from a Rose-breasted Grosbeak (Mrs. H. C. Dunham).

- Braintree, Mass., Sept. 14, from a Crow (J. D. Smith)
 Cold Spring Harbor, N. Y., August, from a Saw-whet Owl (J. M. Andrews)
 Wenham, Mass., Sept. 28, 32 specimens from a Great Horned Owl (J. C. Phillips)
 Wilson Mills, Me., Nov. 4, 2 specimens from a Canada Jay (W. S. Brooks)

The most interesting feature connected with this species is the finding of 32 specimens on one Great Horned Owl. The larger bird fly, *Lynchia americana*, was beginning to leave the bird when it reached the Museum, but the small flies were still among the feathers. While searching the bird for these flies, a number of little seedlike bodies were observed—the pupæ of the fly. Many of these were bright red at first but later turned black. In skinning the bird Mr. J. D. Smith found several flies and pupæ in its ears.

The large bird fly, which will now have to be called *Lynchia americana*, frequents chiefly the hawks and owls, and is to be found on them at all seasons of the year as the following list will show:

- Boston, Mass., Aug. 13, 2 specimens from a Red-shouldered Hawk
 Wenham, Mass., Aug. 14, from a Red-shouldered Hawk (Dr. J. C. Phillips)
 Sherborn, Mass., Sept. 2, from a Red-shouldered Hawk (A. P. Morse)
 Philadelphia, Pa., Nov. 9, from a Red-tailed Hawk
 Middleboro, Mass., Feb. 18, from a Marsh Hawk (E. H. Forbush)
 Candia, N. H., Oct. 1, from a Cooper's Hawk (C. L. Hawthaway)
 West Tisbury, Mass., May 31, from a Sharp-shinned Hawk (Allan Keniston)
 Framingham, Mass., Nov. 1, from Barred Owl (C. A. Frost)
 Hampton, N. H., April 9, from a Long-eared Owl (S. A. Shaw)
 Wenham, Mass., Sept. 28, 19 specimens from a Great Horned Owl (Dr. J. C. Phillips)
 Wenham, Mass., Oct. 9, 3 specimens from a Great Horned Owl (Dr. J. C. Phillips)
 Wenham, Mass., Dec. 2, 3 specimens from a Great Horned Owl (Dr. J. C. Phillips)
 Dover, Mass., Dec. 24, from a Great Horned Owl (A. P. Morse)
 Liberty Hill, Conn., October from a Ruffed Grouse (O. Bangs)
 Monterey, Mass., Oct. 28, from a Ruffed Grouse
 Princeton, Mass., Oct. 9, from Ruffed Grouse (J. D. Smith).

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