Transmission of Poultry Parasites by Birds With Special Reference to the “English” or House Sparrow and Chickens

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Poultry raisers have often suspected the “English” or house sparrow (Passer domesticus Linn.) to be transporters of poultry pests from an infested to an unininfested pen, but scientific observations on the subject are brief and somewhat incidental to other studies.

Since ectoparasites of poultry, such as lice, mites, ticks, bedbugs, and sticktight fleas, cause skin irritation, depilation, and a general rundown condition of the flock, they are of vital interest to poultry raisers and it is important to know how these parasites are disseminated.

A survey of the literature presents evidence that chicken mites and sticktight fleas may be transmitted by the sparrow. These parasites have been reported as occurring on this bird in nature.

According to the literature, Ainslie (1929), Ewing (1922), and Hirst (1916 a) have taken the common poultry mite (Dermanyssus gallinae L.) from the sparrow or sparrow nests. Roberts (1930) and Hirst (1916 b) have reported the tropical poultry mite (Liponyssus bursa Berlese) as occurring on the sparrow. The northern fowl mite Liponyssus sylviarum C. & F. has been recorded as taken from the sparrow by Hirst (1916 a) and Rayner (1932). Stewart (1932) as reported that the sticktight flea (Echidnophaga gallinacea Westw.) was dispersed by the common sparrow.

Lice, mites, ticks, bedbugs, and fleas are flightless, parasitic arthropods and can live only for a short time away from the host. They are unable to crawl for long distances, and the hosts are thought to be specific. Since large numbers of sparrows often occur about chicken pens, this bird was chosen as the most likely means of transferring these poultry pests from one chicken pen to another.

The “English” sparrow, a misleading name for the house sparrow (Passer domesticus Linn.), was introduced from Europe in 1850 and from that time forth has multiplied and become distributed throughout the entire United States. It has become a serious pest about chicken pens, hence it has often been suspected as an agent for dispersal of poultry pests from infested to unininfested pens.

METHODS OF STUDY AND RESULTS OBTAINED

EXAMINATION OF BIRDS FOR EXTERNAL PARASITES

Five hundred and sixty-seven sparrows were collected from different habitats, such as in or about chicken pens, in barns, and in wheat fields. The birds were procured by trapping and shooting. The dead birds were examined for parasites immediately after they were killed. Sparrows were found relatively

1. Master's thesis, Entomology Department, Kansas State College, Manhattan, Kan. The author is indebted to Dr. Roger C. Smith, for many helpful suggestions in this research problem.

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free of ectoparasites. Less than ten percent of the birds collected were found infested with mites (Analogidae); 28 were the host of the sparrow mite (Dermanyssus passerinus). The common chicken mite (Dermanyssus gallinae) occurred on 16 sparrows and Liponyssus sp. was found on three of these birds. The sparrow louse (Degeeriella vulgata) was found on three sparrows and the chicken body louse (Lipeurus heterographus) was found on one sparrow. Other wild birds which are found occasionally about chicken pens were also examined for poultry parasites, but they were free of them, except for the common chicken mite, which was found on the mourning dove.

**EXAMINATION OF SPARROWS NESTS**

Thirty-eight sparrow nests were examined for harboring parasites, of which two nests constructed of chicken feathers were removed from bird houses which were found to be heavily infested with mites fully engorged with blood. Seventeen nests concealed and supported by English ivy vines were removed from the horticulture building, Kansas State College, Manhattan, Kan., on May 25, 1937. Dermanyssus gallinae and Dermanyssus passerinus occurred in all nests lined with chicken feathers except two. Fourteen of the remaining nineteen nests examined were not lined with chicken feathers and contained no mites; five nests which were lined with feathers were mite free.

**PARASITE TRANSMISSION**

**DIRECT TRANSMISSION**

Ten common chicken lice, *Menopon gallinae* L., were carefully removed from a chicken infested with these parasites on February 18, 1937, with a camel hair brush and placed on the feathers of a sparrow to find how long chicken lice would remain on the sparrow. The lice, when placed on the feathers of a sparrow, crawled excitedly over the bird’s body in search of concealment. Since sparrows are nervous and excitable, they fly against the cage and kill themselves. In order to prevent flying against the cage, the wing and tail feathers were clipped close to the body. Two lice in this experiment remained on the sparrow for 44 and 46 hours respectively. More than one half of the lice crawled off within 24 hours.

Since the clipping of the wing and tail feathers of the sparrow did not provide normal protection for the lice as occurs in nature, the experiment was repeated on May 10, and again on June 1, with sparrows having wings and tail feathers unclipped. These experiments revealed similar results, except the lice remained on the sparrow for a longer period of time than in the former experiment, due probably to better protection. The maximum time a chicken louse remained on the sparrow in these tests was for 216 hours, or nine days.

**INDIRECT TRANSMISSION**

Two chickens heavily infested with lice were caged with five parasite-free sparrows on February 17, 1937, to test for transmission of chicken lice from chicken to sparrow by contact or through the dust bath. A dust bath was constructed at one end of the cage in which both chickens and sparrows were observed to dust themselves frequently. The sparrows were examined at intervals of two or three days, but no lice appeared until March 20. Upon examination of the single remaining sparrow it was found to harbor one half-
grown louse, *Menopon gallinae* (L.), along with four minute recently hatched individuals. Empty nit cases were found attached to the feathers on the neck and vent of this bird.

On May 29 the experiment was repeated under similar conditions. Five parasite-free sparrows and two lice-infested chickens were placed in a screened cage about six feet long, three feet wide and three feet high. The ground was loosened so the chickens could make a dust wallow. Upon examination of the sparrows June 1, each bird was found to contain from three to eight chicken lice. Two lice were also found in the dust bath where both sparrows and chickens were observed dusting themselves. On several occasions the caged sparrows were seen sitting upon the chickens' backs. Transmission could therefore have been made also through body contact as well as through the dust bath. The lice remained on three of these birds until the sparrows died five days later. The lice of the two remaining birds were removed for preservation. The experiment was repeated again on June 7, and the lice were found on two of a series of twelve sparrows on June 8.

On February 25, 1937, three sparrows which had chicken lice placed on them were caged about two feet away from two sparrows free of lice. In the meantime the birds possessing the lice had died and the lice had crawled from their bodies and three of them were found on the body of a parasite-free sparrow. The lice evidently left the dead birds and sought the sparrows in the other cage for body warmth and protection.

Eight sparrows were captured at Winfield, Kan., February 1, 1937, and were shipped to the writer at Manhattan, Kan., for examination. The sparrows had been examined previous to shipment for lice and were found lice-free. Chicken lice (*Lipeurus heterographus* N.) were placed on the sparrows and in the box in which they were shipped. When the sparrows arrived they were examined. One sparrow was living and the remaining seven were dead. The living sparrow had nine living lice on its body, and one of the two dead sparrows had two living lice and the other bird three on it. The examination was made two days after the lice were transferred to the sparrow.

**Chicken Lice Longevity Separated from the Chicken as Host**

Chicken lice have remained on the sparrow as host for 216 hours, or nine days, as previously indicated.

On February 18, 1937, a vial of 25 lice, *Menopon gallinae* (L.), were used in an experiment in which the lice were kept secluded from a host. A freshly plucked chicken feather was placed in the vial for the lice to feed upon. The vial was carried in the vest pocket of the experimenter in order to maintain a more or less constant temperature, which was about 94°F. All of the 25 lice died within 27 hours. More than half died at the end of the twelve-hour period.

The experiment was repeated on May 10, and June 1. Seventy-two hours was the maximum time in which the lice lived in a vial with the feather. More than one half died between eight and sixteen hours.

**Chicken Lice Placed in a Vial of Dust**

Twenty-five chicken lice were placed in a vial of dust on February 18, 1937, and were carried in the vest pocket of the experimenter. All of the twenty-five lice died within five hours after the time they were placed in the vial of
BIBLIOGRAPHY


