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TROPICAL FOWL MITE . IN THE UNITED STATES

WITH NOTES ON
LIFE HISTORY AND CONTROL

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TROPICAL FOWL MITE¹ IN THE UNITED STATES, WITH NOTES ON LIFE HISTORY AND CONTROL.

TWO RECORDS of infestations of the tropical fowl mite (*Liponyssus bursa* Berlese) on poultry in the United States thus far have been reported, one at Beltsville, Md., and the other at Raymond, Ill. In both of these instances the infestations proved rather serious and there seems to be no reason why, once established, this mite should not prove to be as serious a menace to the poultry industry as is the roost mite, and possibly more so. It is urged that any occurrence be promptly reported to the Bureau of Entomology so that immediate measures may be applied to stamp it out.

HISTORY IN THE UNITED STATES.

The first occurrence of the tropical fowl mite in this country was reported from Beltsville, Md., April 2, 1917. After this, on January 24, 1919, the mite was reported from Raymond, Ill. In neither case can the source of the infestation be found. The author, in April and May, 1919, went to Raymond and made as thorough an investigation as could be made in the time allotted. Some of the life history was worked out and measures of control applied. The mite in question was found located on a rather isolated farm and none of the poultry of the nearest neighbor was found to be infested. The nearest adjoining farm was about 200 yards away, and there were no others nearer than one-half mile. The infestation here was first discovered in the fall of 1918. The origin of the infestation could not be definitely determined.

At Beltsville the infestation, according to information obtained by Mr. R. W. Wells from Mr. Harry Lamon, of the United States Bureau of Animal Industry, was first noticed on some male birds just after they were removed from their colony houses to winter quarters. This was in the fall of 1916. In the following season the mite was apparently eradicated in that locality, the work being carried out under the supervision of Mr. Lamon. Just how this infestation was obtained is also unknown.

HISTORY OF THE TROPICAL FOWL MITE IN ITS NATIVE HABITAT.

We are indebted to Stanley Hirst, of the British Museum of Natural History, for most of the knowledge of this species. He re-

¹ Stanley Hirst, of the British Museum, who has examined the material from Raymond, Ill., states that the species is "apparently a slight variety of *Liponyssus bursa* Berlese."

ports it from Africa, China, India, Mauritius, Comoro Islands, Bahamas, and South America. It is the common mite on fowls in these countries, *Dermanyssus gallinae* De Geer not being found. He reports it from fowls, the starling, the sparrow, a native bird of the Comoro Islands called "hibon," and a single specimen from a lizard, and states that it is reported to attack man. This mite has been taken from fowls suffering from spirochaetosis, and Hirst thinks that it transmits the disease.

THE TROPICAL FOWL MITE AND THE COMMON ROOST MITE COMPARED.



FIG. 1.—Tropical fowl mite; Engorged specimen. Greatly enlarged.

Liponyssus bursa, the tropical fowl mite (fig. 1), is considerably smaller than *Dermanyssus gallinae*, the roost mite, and it moves about much faster. The posterior end of the abdomen in the female is bilobed in most specimens. The hairs on the dorsum are longer and more prominent than in *D. gallinae*, and the legs are smaller. *L. bursa* is found in the nests and on the fowls. *D. gallinae* is found in cracks of the roost and building, in nests, and

only sparsely on fowls. *D. gallinae* does not deposit eggs and molt on its host; *L. bursa* does. *D. gallinae* feeds at night; *L. bursa* may feed both night and day.

LIFE HISTORY AT RAYMOND, ILL., MAY, 1919.

The eggs of *L. bursa* are laid either on the host or in the nest. Large numbers of them are found in the fluff of the feathers. They are not attached, but may adhere by means of a sticky substance. They have been found also inside the straw from a nest. Off of the host the eggs will hatch in 3 days. The minute larva does not feed, but molts in about 17 hours. It is then ready to feed. The first-stage nymph will molt in 1 to 2 days. The molting period of the second-stage nymph was not determined.

HABITS.

While *Dermanyssus gallinae* has the habit of staying in and about the roost most of the time and breeding there, *Liponyssus bursa* stays either on its host or in the nest and breeds in both of these places. None of these mites is found on the roost. In the case of the English

sparrow most if not all of the breeding takes place in the nests. Very few mites are found on sparrows flying around. There are, however, enough to start an infestation. Young sparrows not fledged may have many mites on them, but after they leave the nest they have only a few. Apparently the mite prefers the fluffy down of the hen feathers lining the nest to the feathers of the sparrow. This may also be the reason why few mites are ever found on young or half-grown chickens. An attempt to infest a young chick devoid of many feathers proved a failure. Mites may be found on loose feathers (fig. 2) on the floor of the hen house or in shady places in the yard. None was

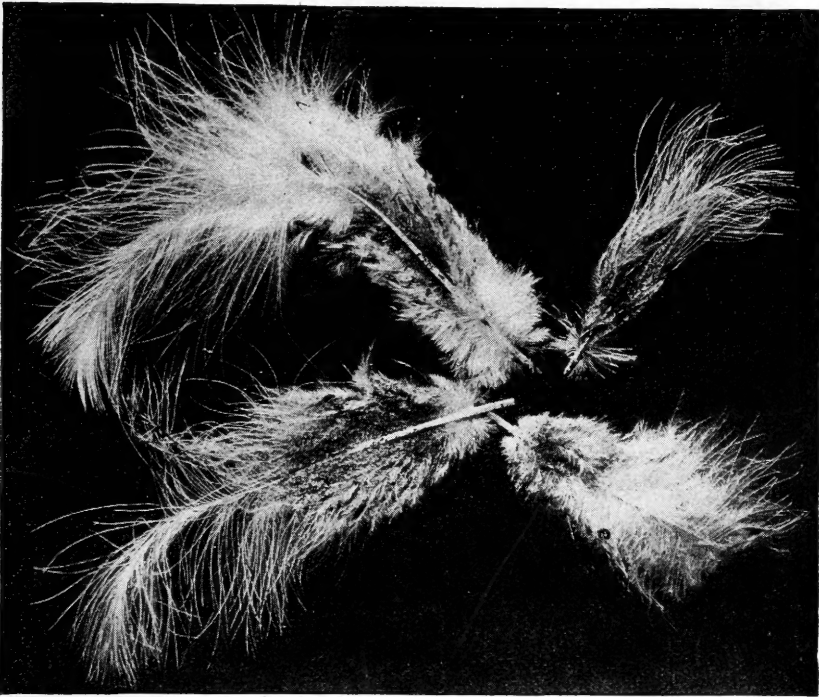


FIG. 2.—Hen's feathers infested with the tropical fowl mite.

found on the grass or in sunny places. Mites on a loose feather placed on a hen's back in the sun were so affected that some of them died before they could get under the hen's feathers.

On the fowl the mites are most numerous about the vent. They seem to like to accumulate on a few feathers rather than occupy many feathers. Some feathers will have hundreds of eggs, mites, and molted skins mixed with mite excreta. This gives the feathers below the vent in an infested fowl a dirty appearance. In heavy infestations, while the mites are most numerous about the vent, they may be quite generally distributed among the feathers on all sections. In

feeding, the mites may be found attached in patches, several hundred feeding in a space the size of a quarter. Since the adult remains on the host it probably feeds intermittently, as it is easily disturbed and runs about on the skin. Some mites readily leave an infested fowl, when it is being handled, to crawl on the hands of a person. Mites came off of a well-infested rooster placed in a box with an uninfested hen and accumulated on the edges of the box. Many hungry mites were found during the daytime on the edges of a box used as a nest. When the box was touched large numbers would crawl quickly upon the hand. If given a chance some of the mites will pierce tender skin. One was observed attached to the back of a lady's hand. The lady stated that the mites often bit her.

HOSTS.

In examining hosts the best method found was to put them in a Mason jar and screw the cover down. If any mites are present they will usually come to the cover of the jar or be found on the glass or the surface of the host. No mites were found on the brown thrush, song sparrow, blackbird, red-headed woodpecker, screech owl, quail, or robin. None was found in a mouse nest or on a mole. Mites were found only on poultry, in hen nests, or on loose feathers in house or yard, and on English sparrows and in their nests. No mites were found on English sparrows or in their nests on any farm except one immediately adjoining the original infestation. Here a few mites were found on flying English sparrows. It should be explained that in the locality studied another mite was more or less abundant in some of the English-sparrow nests examined. After some study the common species and the tropical mite were easily separated. The common species on the English sparrow does not have the bilobed abdomen and the dorsal shield is more rounding at the posterior end.

CONTROL.

Preliminary work.—In previous experiments sulphur, soap, and water had proved so effective against the depluming mite (*Cnemidocoptes gallinae* Railliet) that this was the first remedy tried. A hen having a heavy infestation was dipped in a mixture of 2 ounces of sulphur, 1 ounce of soap, and 1 gallon of water. This was found to be 100 per cent effective. Other treatments which were effective in the preliminary work were: Dusting with sulphur, dusting with pyrethrum, and dipping in a solution of 1 teaspoonful of 40 per cent nicotine sulphate to 1 gallon of water and about one-third ounce of soap. Mercurial ointment greatly reduced the numbers but did not give 100 per cent efficiency. A solution of prepared lime-

sulphur proved effective in killing the mites but broke down the feathers very badly.

Final work.—In the final clean-up an attempt was made to get complete eradication. At the present writing this seems to have been accomplished, though more time must elapse before this can be determined definitely. The poultry houses and chicken coops were cleaned and all nesting material was burned. The manure was lightly sprayed with carbolineum and then hauled to a garden or other sunny place inaccessible to fowls. The inside walls of the houses and coops, the roosts, dropping boards, floors, and nests were either sprayed or painted with carbolineum.

The fowls were then given a thorough dusting with sulphur, a dust can being used and the material being applied liberally. At the time of treatment it was raining. The fowls, freshly dusted with sulphur, were sent out into the rain. No bad results were noted. The owner of the flock was sure this treatment would be injurious, but confessed she saw no injury. The writer believes that from this and other experiments the common notion that fowls are injured by getting wet after being dusted with sulphur is pure fallacy. The half-grown chickens and the mother hens were treated in like manner. The baby chicks were not treated, but the brood coops were given clean nesting material and then dusted with sulphur.

A sheep shed with an open front and a straw-thatched roof was found to be used as a breeding place for hundreds of English sparrows. The front was closed with burlap, except for a small opening at the ground through which the sheep might enter. After this change five sparrows were the greatest number seen in the shed when examination was made at night. All sparrow nests that could be located were robbed of eggs or young and the nests burned. This was done all over the farm. The owners were advised to keep up a continuous war against the sparrow by destroying eggs, young, and nests whenever found.

INJURIOUSNESS.

A continuous heavy infestation of the tropical fowl mite often results in the death of the fowl. Sitting hens will leave their nests if not relieved of the infestation. Although the disease spirochaetosis has not been reported in this country, this disease may be present nevertheless, and with this mite present the danger of its spread would be increased. Some fowls in a flock seem to be more heavily infested than others. Apparently those fowls that dust themselves most are freest from the mite. Infestations on cock birds appear to average heavier than on hens.

CONCLUSIONS.

1. The tropical fowl mite (*Liponyssus bursa*) is a recently introduced poultry parasite.
2. The two known infestations in the United States have apparently been stamped out.
3. If the pest becomes generally established in this country it will undoubtedly constitute a serious menace to the poultry industry; hence it is important that it be excluded or, if introduced, promptly eradicated.
4. Since this mite feeds and breeds on poultry it could be introduced readily into the country and disseminated through the shipment of infested stock.
5. It may be stamped out either by dipping fowls in sulphur, soap, and water, or by giving them a heavy dusting with sulphur. At the same time the houses, especially the nests, floors, and dropping boards, must be treated with carbolineum.
6. A continuous war against the English sparrow should be instituted in a locality where the mite is discovered. Nests should be robbed and destroyed by fire and the nesting places eliminated.

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