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### DIPTERA AT HOME ON SPIDERS' WEBS.

BY FREDERICK KNAB,

WASHINGTON, D. C.

Spiders are generally considered very efficient enemies of Diptera and in truth one frequently finds flies entangled in spider webs. Much has been made of the effectiveness of spider webs in the reduction of mosquitoes and one frequently finds expressions of the most emphatic kind, by economic writers, concerning the usefulness of spiders. I need only call attention to the writings of McCook, John B. Smith and Léon (Roumania). If, however, one searches for accurate observations in support of these statements one finds little more than generalities. In fact species of Diptera belonging to several families of Nemocera have been observed resting unharmed upon spider webs and evidently select this peculiar habitat for repose.

At the meeting of the Entomological Society of Washington on July 6, 1911, Mr. W. L. McAtee presented an observation which showed that at least some species of mosquitoes do not come to grief in spider webs. He found a large number of *Anopheles quadrimaculatus* sitting on a spider web in a hollow tree. They did not stick to the web and on being disturbed they took wing without difficulty. Further observation showed that these mosquitoes returned after having taken flight and were perfectly at home on the web.<sup>1</sup> Since then I have come upon a record of another similar observa-

<sup>1</sup> Proc. Ent. Soc. Wash., Vol. 13, p. 193 (1911).



tion, made in Italy in 1900. It was made by Drs. Sambon and Low during their world-famed malaria experiment in the Roman Campagna. They naturally gave considerable attention to the habits of *Anopheles* and in the final account of their experiment we find the following: "The fully developed *Anopheles claviger* was found in great numbers in the houses, stables and henhouses, frequently resting on cobwebs."<sup>1</sup>

Species of at least three other families of Nemocera frequent spider webs. During my trip to Central America, in 1905, I found a species of Cecidomyidæ which was perfectly at home on a spider web. At Port Limon, Costa Rica, on the edge of the jungle, I examined a water-barrel for mosquito larvæ. A spider had spun its web over a large part of the open head of the barrel and clinging to the under side of the web were a number of Cecidomyidæ. They were all the one species and evidently at home on the web, for, upon being disturbed, they took flight but soon returned to the web. A number of them were captured, and it was found that both sexes were present. The species has remained undetermined until, a short time ago, I submitted the specimens to Dr. Felt. He has been kind enough to study them and informs me that they are an undescribed species which he has referred to the genus *Coquillettomyia*.<sup>2</sup>

The following summer, much to my surprise, I found a cecidomyid with identical habits in the vicinity of Washington. The first specimens were found on webs on the window of a cabin in the woods. They were there in some numbers and behaved in the same manner as those I had taken in Costa Rica. Afterwards I found them repeatedly, I might almost say unfailingly, on the cloth-like webs of certain spiders (probably *Amaurobius*). They were present in considerable numbers, clinging to the under side of a large web, in the hollow of a tree. In the woods I have found them also on webs not particularly sheltered from above, although in such situations they appear to be more rare. As in the Costa Rican case both sexes occur on the webs. I have also submitted specimens of these insects to Dr. Felt and he has kindly examined them. He refers them to the genus *Clinodiplosis* and informs me that they are probably an undescribed species. He has further informed me that in

<sup>1</sup> Brit. Med. Journ., Vol. 2 for 1900, p. 1682.

<sup>2</sup> Described by Dr. Felt in this number on p. 154.



1906 *Coquillettomyia dentata* Felt was observed in numbers on cob-webs at Newport, New York.

A record of similar habits comes from Australia. Skuse, in the introductory part of his treatment of the Cecidomyidæ, speaks of the imagos frequenting spider webs "sometimes in tens of thousands."<sup>1</sup> Apparently he was under the impression that the habit is general within the family, for no genera or species are mentioned. My own observations lead me to believe that the habit is restricted to certain genera, possibly to certain species of these genera. Dr. Felt informs me that Kieffer has recorded at least one species of Cecidomyidæ as found on spider webs in Europe, but I have not had the necessary time to search the numerous writings of this author for the record.

In September, 1910, I was surprised to find Diptera of still another family frequenting a spider's web. The web was a large "orb web" of an epeirid, known to be particularly fatal to insects, and was in an exposed situation at the margin of a stream. Upon the threads of this web sat a number of small flies, which, on being frightened, flew off but promptly returned to the web. These flies proved to be Chironomidæ and are an apparently undescribed species of the genus *Bezzia*. It would seem that in this case there is an obvious reason for the presence of the flies on the web. They are in all probability mess-mates of the spider. There are a considerable number of observations which show that certain species of the group to which the present insect belongs (Ceratopogoninæ) suck the juices of other insects. In the present case the prey of the spider no doubt furnishes a convenient source of food for the flies. The fact that all six of the specimens captured from the web are females supports this view.

In a recent paper on East Indian Tipulidæ, by De Meijere, observations made in Java by Doleschall and by Jacobson are given which show that at least two species of Limnobiinæ habitually suspend themselves from horizontal spider threads and by this means perform a curious dance.<sup>2</sup>

One of these species is *Dicranomyia saltens* Dol., the other *Mongoma pennipes* O. S. With reference to the first, which is abundant

<sup>1</sup> Proc. Linn. Soc. N. S. Wales, 2 ser., Vol. 3, p. 52 (1889).

<sup>2</sup> Tijdschr. v. Ent., Vol. 54, p. 22-23, 50-51 (1911).



in shady woods, Jacobson is quoted as follows: "It has the habit to suspend itself with the front legs from spiders' webs; when one of the fore legs are wanting, as frequently happens with these delicate flies, one of the middle legs is utilized. One sometimes sees twenty or more flies close together, suspended from a horizontally stretched spider's thread; they all bob up and down very rapidly, at the same time swaying to and fro, sometimes in unison and sometimes not. This comical rope-dance is continued for a long time. Because the tips of the legs are white they are very plainly visible, while the spider thread on which the flies hang is generally not visible, it appears as if they danced in the air and touched each other with the tips of their front legs." Doleschall, who first observed this curious dance, did not detect the spider threads, which was perhaps due to the fact that his observations were made inside of houses.<sup>1</sup> Jacobson, in the paper quoted above, comments on Doleschall's observation as follows: "If Doleschall describes the flying in a chain without mentioning the spider thread, this is due to incomplete observation. These *Dicranomyias* never form chains without being suspended from spider threads. These threads are however sometimes so fine that one can only see them from a definite position (so, for example, that they reflect the sunlight)."

Except in the case of the chironomid, no good reason is apparent for the presence of the insects on the spider webs. The habit certainly shows some adaptation. Possibly the web serves as a refuge where these insects may rest secure from other insects. Some explanation should be sought for the fact that these *Diptera* can frequent the webs without becoming entangled or being preyed upon by the owner.

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## NEW GALL MIDGES OR ITONIDÆ (DIPT.).

BY E. P. FELT,

ALBANY, N. Y.

Below we describe a number of new western forms received through the kindness of Prof. E. Bethel, Denver, Col., and of Mr. P. H. Timberlake, of the U. S. Bureau of entomology.

<sup>1</sup> *Natuurk. Tijdschr. Nederl. Indie*, Vol. 14, p. 390 (1857); quoted by Osten Sacken, *Berl. Ent. Zeitschr.*, Vol. 26, p. 88 (1882).



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