

Schwarz of the Bureau of Entomology for determination, but his report has not been received at the present writing.

This insect has been known to occur in California for a good many years and its economic status has been based entirely on its leaf-feeding habits. This above ground injury to the vine, while it has been very great in some cases, is really unimportant as compared with the more serious and permanent injury to the roots. In some vineyards the crop has been reduced a third or a half and in one instance that came under our observation this year, two or three acres of vines were dug up on account of the injury to the roots by the larvæ of this insect.

---

APHIS GOSSYPHII GLOV., AND ITS ALLIES—MEDICAGINIS KOCH, RUMICIS LINN., FORBESI WEED, OENOTHERIAE OEST., AND CARBO-COLOR GILL.

By C. P. GILLETTE,<sup>1</sup> Fort Collins, Col.

In my study of the *Aphididæ* of Colorado I have become convinced that there is still considerable confusion in the literature treating of the species having a close resemblance to *Aphis gossypii* Glover. I do not pretend to be able to straighten out all the crooked places, but hope to be able to offer observations and conclusions that will help to that end.

For several years past *Aphis gossypii* has done more harm than all other insect pests together to the canteloupe and melon vines grown in the Arkansas Valley in this state. In accord with the observations made by several other writers, the first appearance of the lice upon the vines takes place when the latter are just nicely beginning to run, but they seldom attract much attention until the vines are two feet or more in length. Once upon the vines, the lice increase with great rapidity. In our breeding cages Mr. Bragg has repeatedly reared new-born lice to the reproductive stage in eight days, and a common number of births per day has been from six to twelve. As a result the enemies,—parasites, ladybeetles and syrphus flies, finding an unstinted supply of food, also multiply rapidly and by about the second week of July often cause the lice to rapidly decrease in numbers and so save a large proportion of the melon crop. The lice continue upon the vines however to the time when killing frosts render the plants

---

<sup>1</sup>I wish especially to acknowledge the assistance of Mr. L. C. Bragg in accumulating the data for this paper.



no longer of service as food. During July winged individuals become very scarce, but the winged lice soon appear in considerable numbers and continue throughout the year.

### Identification of Species

#### *Aphis gossypii* Glover.

Our observations upon this species continued for nearly a year before we were able confidently to separate it and *medicaginis* Koch. from each other and from closely related forms. Some of the distinguishing characteristics which later enabled us to do this are the following:

In *gossypii* the black appearing apterous females are really a very dark green; they nearly always have some light mottling upon the dorsum of the abdomen, due to the light colored embryos showing through, and these dark females are *never* highly polished.

Fully mature apterous females have antennæ and cornicles distinctly longer than in *medicaginis*.<sup>2</sup>

The larvæ of the first, second and third instars, especially of the winged form, nearly always show a distinct yellowish brown or pale salmon colored area upon the dorsal portion of the abdomen anterior to the cornicles and a conspicuous dark transverse band at the cornicles.

There is nearly always much variety of color in both the young and the adult apterous individuals, some being very dark, to the naked eye appearing black, and others with intergrading shades passing to very light yellow or tan colored viviparous females. The offspring of these light individuals may be as dark as the darkest through their entire life.

The pupæ are beautifully tessellated over the dorsum of the abdomen with silvery white.

So far as our observations have gone, *gossypii* has not been found colonized upon so large a range of food plants as *medicaginis*, which seems to be able to thrive upon almost any green thing.

Sexual forms and eggs we have been unable to find.

#### *Aphis medicaginis* Koch.

The fully adult apterous viviparous females of this species we have found, without exception, deep black and highly polished. They shine like glass beads among the other lice of the colonies and may be very few in number or entirely absent.

---

<sup>2</sup>Care must be taken not to mistake immature individuals, just before the last molt, for the fully mature form; they may be fully as large but they have very much shorter cornicles and antennæ.



The pupæ, while much resembling those of *gossypii*, do not have the tessellated dorsal spots so silvery white.

The young larval forms do not have the characteristic yellowish brown color of *gossypii* upon the dorsum of the abdomen nor the green transverse band, and there is not the range of light and dark forms among the apterous lice found in the colonies.

The tibiæ and basal half of the antennæ are more conspicuously whitish than in allied species.

This species has been specially partial to white sweet clover and *Glycerrhiza lepidota* here, two plants upon which we have never taken any of the allied species.

Sexual forms and eggs we have not been able to find.

*Aphis rumicis* Koch.

It seems almost certain that several writers, including Oestlund in his description,<sup>3</sup> have reported *medicaginis* as *rumicis*. I do not think that the *rumicis* of Linnæus has come under our observation, unless, possibly, it proves to be the same as *carbocolor* Gill.

*Aphis carbocolor* Gill.

This louse is somewhat larger and more robust than *medicaginis*, the adult apterous individuals are all deep dull sooty black, never polished, and it passes into the sexual forms in the fall, the females of which deposit eggs in great numbers about the crowns and bases of the leaves and stems of species of *Rumex*, especially the yellow dock. The cornicles are decidedly shorter and weaker than in *gossypii* or *medicaginis*. Winged viviparous females are shining black upon both thorax and abdomen. The seventh antennal joint and the antenna as a whole are longer than in *medicaginis*.

*Aphis oenotheriæ* Oest.

This louse has been considered a synonym of *gossypii* by Sanborn, which is probably a mistake as this is a green louse, occurring upon the primrose only, so far as we have observed, and never having the black apterous females of *medicaginis* nor the variety of colors exhibited by *gossypii*. It is possible that Prof. Sanborn had true *gossypii* from *Oenothera* and that he had not seen true *oenotheriæ*, which is a very common species in Colorado and quite distinct from *gossypii*.

*Aphis forbesi* Weed.

I would not include this species as belonging to the *gossypii* group were it not for the fact that it has been confused with *Aphis gossypii*

<sup>3</sup>Bull. 4, Synopsis of the Aphididæ of Minn. p. 61.



in a few instances. Prof. Sanderson<sup>4</sup> has already recognized it as a good species. We have not taken this louse in Colorado, but specimens that were sent me by Mr. J. J. Davis, State University, Urbana, Illinois, have been examined and prove to be easily distinguishable from any of the other species mentioned in this paper. In about three fourths of the examples examined, all of which were apterous females, the third and fourth joints of the antenna were united in one with no signs of a dividing suture. Dr. Weed in his description of this species describes it as having six-jointed antennæ. In the specimens having joints 3 and 4 separate, joint 3 but slightly exceeded joint 4, and the two joints together made one sub-equal in length with joint 7. In *gossypii* joint 3 alone is always longer than joint 7. *A. forbesi* is also smaller and is a root feeder.

### Influence of Host Plant upon Aphid Characteristics

An impression seems to be more or less prevalent that a species of plant louse may vary much in structure and general appearance, depending upon the plant upon which it lives and draws its nourishment.

In all our experience transferring lice from one food plant to another and observing them upon widely varying plants in a state of nature or in hot-houses, we have never had any reason to think that a species is perceptibly changed in appearance because of a change of food plant. I am aware that there are migrating forms that are different in appearance from their immediate ancestors and that they may go to a different food plant, but in such cases the change came before migration or was "predestined" to appear in the first generation after migration. For example, the stem mother of *Phorodon humuli* upon the plum is quite different from the migrant that goes back to the hop<sup>5</sup>, but the change came before deserting the plum. The oviparous female in the fall, which is the product of the return migrant from the hop, is very different from the migrant, but not at all because of its change in diet. It is the sexual female form of the species and what it develops into was determined in every case before the parent left the hop. Such changes as these, coincident with a change of food plant in the life histories of plant lice, can be duplicated many times over by instances where there is not a change of host plant. As familiar illustrations recall the remarkable variations

<sup>4</sup>Bull. 49, Del. Agr. Sta.

<sup>5</sup>I do not mean by this that the viviparous females upon the plum can be distinguished from the viviparous females upon the hop.



in the forms of *Phylloxera vastatrix*, which remains throughout life upon the grape, and of *Schizoneura lanigera*, remaining upon the apple, or of *Schizoneura americana*, without leaving the elm.

### Do *Aphis gossypii* and *medicaginis* Lay Eggs?

Mr. Pergande mentions two instances where he thinks he may have discovered eggs of *gossypii*, but from his written statements it seems that he has not seen the sexual forms, and the probability of the eggs found being the eggs of *gossypii* does not appear to be very strong. For two years we have followed these lice closely without ever finding sexual forms or eggs at any time of the year. During 1906-'07 both these lice were followed all winter upon out-of-door plants by Mr. Bragg, and the present winter they have been followed into December, past several zero nights, and they are still in fine condition, but no males or oviparous females or eggs have been discovered. I would not dare express the opinion that sexual forms never appear in these species, but so far as our observations go, it seems very doubtful about their occurring in Colorado. We shall continue to search carefully for them.

### Food Plants

As mentioned above, we have seen *Aphis oenotheriae* upon the prim-roses only, and *A. carbocolor* has been taken by us upon no plants outside of the genus *Rumex*.

*Aphis gossypii* we have taken colonized from the cotton plant, canteloupe, muskmelon, watermelon, cucumber, winter squash, pumpkin, the native wild gourd (*Cucurbita foetidissima*), Shepherd's purse (*Bursa B-pastoris*) (which is its favorite plant upon which to spend the winter in Colorado), iron weed (<sup>6</sup>*Ambrosia trifida*), mare's tail (<sup>6</sup>*Erigeron canadensis*), *Rumex* sp. *Convolvulus* sp., *Lepidium virginicum*, <sup>6</sup>*Taraxicum dens-leonis*, <sup>6</sup>*Asclepias* sp., and in the summer upon the leaves of buckthorn (*Rhamnus cathartica*) and *Catalpa speciosa*. We have never found it upon strawberry or purslane, though looked for much upon these plants. Many of the other plants that have been named as the hosts for this species, and which have come under our observation in Colorado, we have found infested by colonies of *Aphis medicaginis*. I do not mean to say that I think the records that have been given for *gossypii* on these plants are incorrect, but simply state the results of our observations in Colorado.

The plants upon which we have observed *Aphis medicaginis* established and colonized are: White sweet clover, yellow sweet clover,

---

<sup>6</sup>Found on one plant only.



red clover, white clover, alfalfa, several species of native locos and lupines, wax beans, black locust, licorice (*Glycyrrhiza lepidota*), apple, pear, plum, soft maple, boxelder, shepherd's purse (apparently its favorite over winter plant here), *Lepidium virginicum*, *Chenopodium* sp., *Rumex* sp., *Malvastrum coccineum*, primrose (*Anogra albicaulis*), Tansy mustard (*Sophia* sp.), dandelion and lawn grass (*Poa* sp.).

## THE CATALPA BUD MAGGOT

By H. A. GOSSARD, Wooster, Ohio

For several years the tender growing twigs of catalpa have been attacked by insect larvæ, causing the twigs to become slightly swollen and to blacken and wilt at the terminal end. This trouble was so pronounced and excited so much complaint among the catalpa growers in various sections of Ohio, that the questions relating to it were referred to Mr. J. S. Houser for special investigation.

From an investigation made in the spring of 1907 of all the twigs on 15 three-year-old trees growing at Wooster, 49 per cent of them were found to have been damaged by this pest. Mr. Houser's description of the injury is as follows:

"The tender growing twigs of catalpa are attacked by maggots, causing the twig to become slightly swollen and to blacken at the point of injury. This occurs usually about three or four inches below the tip during the early part of the season, and at a lesser distance down later on when the twig is growing less rapidly. The twig above the injury dies. Following the death of the tip in early summer, the next node below develops one or more tips and frequently a cluster of leaves, giving the twig a bushy growth (Plate 1); following the later attacks the stem appears as in Plate 2, figure 1. The ultimate result after continued topping is a stunted, crooked, forked growth. (Plate 2, figure 2.)"

A large series of infested twigs were enclosed in breeding jars, the cuttings being sunk into moist earth. The specimens were collected at various periods of the growing season and through two summers. Though it seemed quite certain from some larvæ found in the affected terminals that a Cecidomyid would be obtained, it was not until the second summer that a midge was reared that seemed to agree with the description of *Cecidomyia catalpæ*, hitherto recorded as infesting the pods and destroying the seeds of catalpa. The few specimens obtained have been examined by Mr. Coquillett and Dr. Felt, and while both are agreed that the specimens are near *C. catalpæ*, they reserve



Gillette, C. P. 1908. "Aphis gossypii Glov., and its allies—medicaginis Koch, rumicis Linn., forbesi Weed, oenotheriae Oest., and carbocolor Gill." *Journal of economic entomology* 1(3), 176–181. <https://doi.org/10.1093/jee/1.3.176>.

**View This Item Online:** <https://www.biodiversitylibrary.org/item/37189>

**DOI:** <https://doi.org/10.1093/jee/1.3.176>

**Permalink:** <https://www.biodiversitylibrary.org/partpdf/325858>

**Holding Institution**

New York Botanical Garden, LuEsther T. Mertz Library

**Sponsored by**

The LuEsther T Mertz Library, the New York Botanical Garden

**Copyright & Reuse**

Copyright Status: NOT\_IN\_COPYRIGHT

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.