

## LIFE-HISTORY NOTES ON TWO FULGORIDÆ.

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I. *Amphiscepa bivittata* Say.

August 1, 1902, while sweeping with the insect net amongst tall grass, wild balsam and other weeds, at Cedar Point, Sandusky, Ohio, several immature insects were secured, that later proved to be the larvæ of *Amphiscepa bivittata* Say. One adult was discovered upon a grass blade within one-fourth inch of the exuviae of one of the larvæ, and it looked fresh, as though it had but recently assumed its mature form. Several larvæ were taken home alive and placed upon grass in a bell-jar; and within a week they had all transformed to the adult stage, thus proving the identity of the larvæ; in fact, I was so fortunate as to observe one specimen in the act of moulting, on the morning of August 4th.

August 2d and August 8th larvæ were taken from golden rod and other weeds along a hedge fence enclosing a clover field, about three miles southeast of Sandusky; but none were taken later than that date; adults were taken in considerable numbers, however.

Few specimens were found at rest on the plants, but from the ones that were found, it would seem that they habitually perch upon a stem just below the base of a petiole (VI-5), and there puncture the stem to secure the sap for food. In this position they have some resemblance to the tufts of hairs often found at base of petiole or in the axil. They are very active when disturbed, leaping about as suddenly as the adults do, but may often be secured by quickly putting the mouth of the killing bottle over them before they leap.

## DESCRIPTION OF LARVA.

Length 4 mm.; breadth  $2\frac{1}{2}$  mm.; back very convex, so that height nearly equals breadth; general color whitish with brown markings; head broad, nearly straight across in front, slightly incurved in middle, prominent marginal carina in front of eyes; vertex twice as broad as long, whitish, with a median darker stripe; frons darker at base, some white dots in this darker area, a row of dark-centered pustules near each margin; clypeus and beak dark brown; eyes pale brown with a few lighter areas; first segment of antenna very short, second segment subglobose, bristle black, enlarged at base; pronotum slightly shorter than vertex, broader behind the eyes, white median carina, bordered on each side with a darker stripe, which is a continuation of the median stripe of vertex, and extends the whole length of thorax and abdomen; a dark brown spot on pronotum behind the eye, remainder of pronotum whitish, nearly covered with black-centered pustules; mesonotum twice as long as pronotum, whitish, dotted with black, a dark brown area at base of wing pads, at each outer anterior

part is a rounded elevation covered with black-centered pustules, a similar elevation on the outer posterior part of the metanotum; metanotum slightly shorter than mesonotum; wing pads greenish, with some traces of veining and some brownish markings, projecting slightly beyond the metanotum; abdomen short and thick, seven segments, whitish, with light brown markings, the brown areas dotted with white, a dark-centered pustule on each side and somewhat removed from median line in segments 3, 4 and 5, similar pustules on the sides of segments 2, 3, 4, 5 and 6, four on the end, four on the 3rd, three on the 4th, two on the 5th, and one on the 6th, a brownish area in the region of these lateral pustules; segments 3, 4, 5 and 6 have a yellow spot on the tergum on each side, about midway between median line and margin, somewhat nearer to the margin; ventral side of abdomen white; first and second femora and tibiae banded, brown and white; posterior femora brown, white at knee; posterior tibiae brown, with lighter stripes, three spines on outer edge (wanting in the adult), one large and six smaller spines at apex, some green in tibiae and tarsi; hind tarsus three-jointed, first joint wide, with four spines at apex, third joint with two hooks.

The coloration varies, some specimens with more brown than others, and in some the wing pads are greener.

Abdomen covered with a white, thread-like, cottony secretion, which at the tip of abdomen is formed into a tuft; a pair of similar tufts on metathorax, and another pair on mesothorax. This material is very easily rubbed off in the insect's movements, or in being handled. It gives to the insect a protective resemblance to tufts of hairs on leaves or in the axils of petioles.

## II. *Ormenis septentrionalis* Spin.

Four larvæ of this species were collected, August 4, 1902, from a hedge fence composed of various kinds of shrubs, and bordering one side of a clover field, in the vicinity of Sandusky, Ohio. They were on the underside of crumpled leaves of the dogwood (*Cornus asperifolia*). Each one was on a separate leaf, situated in a depression between crumpled folds, and was covered over so as to be almost hidden by the white cottony secretion of wax from its abdomen (Fig. 10a). Some of this substance was also spread around on the leaf, upon an area having a radius of one-half inch to one inch from the insect. It is probable that the crumpled nature of the leaf was the result of its being punctured by the insect in feeding. It seems evident that, unless disturbed, they remain upon the same leaf throughout the larval period, for leaves were found which had two and sometimes three exuviae situated on the places where the insects had been feeding, as shown by the presence of the cottony substance.

A dozen or more adults were taken from the bushes in this same locality. One specimen, still soft and fresh, was found on a leaf near the exuviae of a larva amidst its cottony surroundings. About two dozen leaves were found having the cottony substance and the exuviae of larvæ. These were mostly dogwood leaves, only one being red oak, one hawthorne, and two were prickly ash leaves.

On the following day, however, examining a different part of the same hedge, exuviae were found more abundantly on leaves of

the climbing bittersweet (*Celastrus scandens*). A few larvæ were taken on bittersweet leaves, also. As before stated, the larvæ evidently remain in one location; that is, upon the same leaf for quite a period of time; but when disturbed they move about, and frequently in attempting to capture them they would make a sudden leap, as all of this family of insects are in the habit of doing.

August 7th, exuvizæ were found abundantly upon wild plum leaves, and a few on leaves of wild grape. From these observations it is evident that this species has quite a variety of food plants, the larvæ and exuvizæ having been found on climbing bittersweet, dogwood, plum, grape, prickly ash, red oak and hawthorne, most abundantly on the first mentioned and in less numbers on the others, in the order named.

Several visits were made to this particular hedge, and I was always rewarded by the capture of several adults and an occasional larva; but search upon other similar hedges of the vicinity failed to yield a single larva or show evidences of their having been there, although an occasional adult was taken.

#### DESCRIPTION OF LARVA.

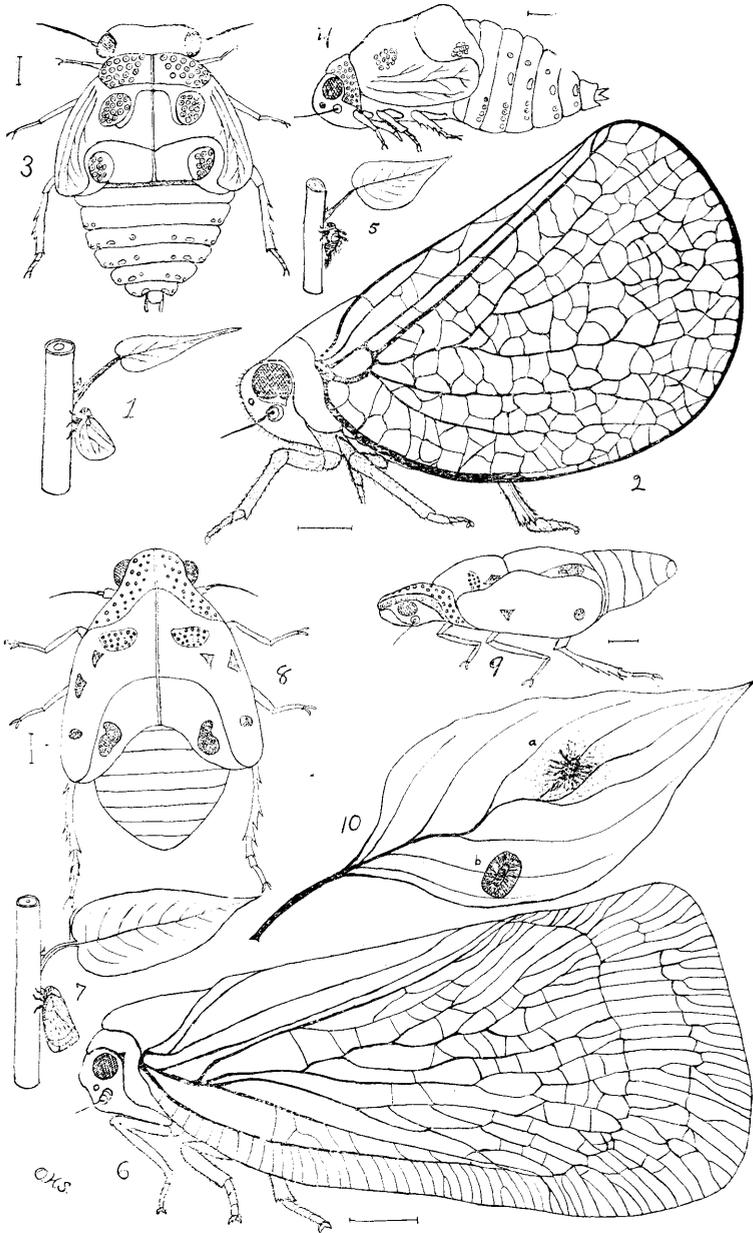
Length 4.5 mm.; width, 2.5 mm.; somewhat depressed, only about one-third as thick dorso-ventrally as laterally; a very pale green, even to whitish; head narrow, projecting slightly beyond eyes, rounded in front, above covered by the pronotum; frons broad, three carinæ, margin extending laterally slightly in front of eyes; eyes pinkish brown; ocelli wanting; antennæ cylindrical, first segment shorter than the second, bristle brown, enlarged at base; pronotum produced forward, covering the head, deeply emarginate behind, the angle rounded; whole pronotum covered with black pustules having lighter centers, or many entirely black; mesonotum has two convex pustule covered areas, one on each side between median line and wing pads; a median groove extends the length of thorax, most pronounced on the mesothorax; wing pads extending to the third abdominal segment; each fore wing pad has two triangular black patches near base and a rounded black patch near apex; a large black patch on hind wing pad; these black patches are not always prominent, and vary in size, shape and position; legs pale green; posterior tibiæ with three spines on outer edge and a large one at apex, also six smaller apical spines; tarsi three-jointed; feet brownish, and the tibial spines tipped with brown; abdomen covered with a white filamentous waxy secretion, which at the tip of abdomen is in tufts; this secretion is produced in such abundance as to entirely cover the insect when feeding upon the surface of a leaf, and thus serves as a protection on account of its resemblance to a bunch of spider web or a tuft of cottony hairs upon the leaf.

#### EXPLANATION OF PLATE.

Figs. 1-5 *Amphiscepa bivittata*. Fig. 1—Adult on stem, natural size. Fig. 2—Adult, x 10. Fig. 3—Larva, dorsal view, x 10. Fig. 4—Larva, lateral view, x 10. Fig. 5—Larva on stem, natural size. Figs. 6-10—*Ormenis septentrionalis*. Fig. 6—Adult, x 10. Fig. 7—Adult on stem, natural size. Fig. 8—Larva, dorsal view, x 10. Fig. 9—Larva, lateral view, x 10. Fig. 10—*a*, Larva on leaf, natural size; *b*, Cocoon of a parasite that infests the larva of this species.

OHIO NATURALIST.

Plate 6.



SWEZEY on "Life-History Notes on Two Fulgoridae."