

DIPTERA
INSECTS

THE EARLY STAGES OF SAYOMYIA PUNCTIPENNIS SAY.

[Diptera, Culicidæ.]

By FREDERICK KNAB.

Sayomyia punctipennis appears to be the most common species of its genus in the upper Mississippi Valley and although the larva has been frequently alluded to it has, up to the present, remained uncharacterized. A few larvæ of this form were taken by the writer at Urbana, Ill., on October 2, 1904, in a temporary puddle, where they were associated with numerous larvæ of *Culex pipiens* and a few of *Culiseta conso-brinus*. In confinement the larvæ of *Sayomyia* preyed upon the young larvæ of *Culex*, and from one that pupated the imago was disclosed October 10.

The larva of this small species resembles very much the larvæ of the other species of *Sayomyia* in general appearance. When the larva apprehends danger it sinks slowly to the bottom, maintaining throughout its horizontal position. The writer has also observed this maneuver in the larvæ of other species of the genus and in those of *Corethra* (*Mochlonyx*). Dr. Fr. Meinert, in his work "De eucephale Myggelarver," has already noted this action of the larva, without, however, offering any explanation of the manner in which it is accomplished. When suddenly disturbed the larva changes its position very rapidly by a switching motion in which the two extremities are brought nearly together.

A few more larvæ of the present species were obtained on Nov. 8 when dipping for *Culex* larvæ in Salt Fork, a small stream on the outskirts of Urbana. In February, 1905, more larvæ were obtained by some university students from a pond known as Crystal Lake, formed by the damming of the above mentioned stream. When a hole was cut through the ice these larvæ rose to the surface.

This species is the "*Corethra* larva" alluded to by Dr. S. A. Forbes in several of his writings, as the writer ascertained by an examination of the material in the collection of the Illinois State Laboratory of Natural History. From the data accompanying this material it appears that the larva of this species frequents the open water of lakes and rivers. Two plankton hauls from the Illinois River in mid-stream at Havana, Ill., August 12 and October 14, 1896, contain specimens of this larva. Other specimens, from Cedar Lake, Ill., taken October 23, 1882, are those referred to by Doctor Forbes in his articles, "*Leptodora* in America" (Amer. Naturalist, 1886,

p. 1057) and "The Lake as a Microcosm" (Bul. Peoria Sci. Assn., reprint, 1887, p. 8).

Although closely similar to other species, the larva of *Sayomyia punctipennis* possesses distinctive characters in the form of the leaf-like appendages of the ventral surface of the head and in other structural details. Behind the eighth abdominal segment a pointed hood-like flap projects backward. This may perhaps be present in the larvæ of other species, as it would be easily overlooked in such transparent larvæ. A more detailed description follows:

Larva.—Length about 8 mm. Form (fig. 5) elongate, broadest at the thorax and gradually tapering to the slender terminal segment. Air

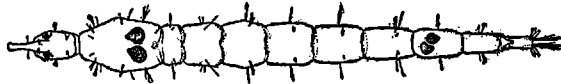


FIG. 5.—*Sayomyia punctipennis*: Larva, dorsal view.

vesicles present in the thorax and seventh abdominal segment. Body entirely colorless and transparent. Antennal bristles and mouth parts pale yellow-brown; foramen of head tinged with brown; eyes black; air vesicles with round, closely approximated, dark-brown pigment spots.

Head (fig. 6) rather small, broadest at the eyes. Eyes situated behind the middle, large, compound, with an emargination behind to receive the small accessory eye. The head is prolonged anteriorly into a process which bears at its extremity the closely approximated anten-

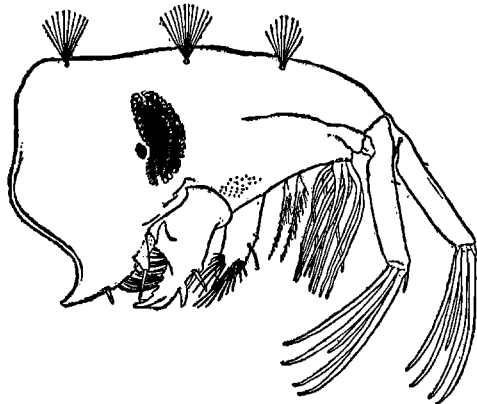


FIG. 6.—*Sayomyia punctipennis*: Head of larva.

næ. This process about equals in length the head itself; at its base

it is about a third as broad as the greatest width of the head; near the middle it is much narrowed by the concave sides. Antennæ inserted close together at the extremity of the process, directed downward. They are of a single stout elongate segment bearing at its tip six tapering slightly curved spines. Of these spines four are of nearly equal length with the antennal segment and one is a third shorter than these, while the sixth spine is small and very short. Inserted ventrally, just behind the antennæ, is a pair of pendant appendages about equal in length to the antennal segment. Each of these appendages consists of five long filaments united at the base. About midway between these and the maxillæ are delicate pendant organs termed "leaflike appendages" by Dr. E. P. Felt (N. Y. State Mus., Bul. 79). In the present species these leaflike appendages are extremely long and slender and their length is about two thirds that of the antennal segment. Beyond the base these appendages expand into a small lamellate portion which remains quite small and again tapers into the very long and slender point. The anterior margin of the appendage gives rise to a series of long rays and on the posterior margin the basal fourth is unarmed while beyond are a succession of these slender spines. The maxillæ are long, stout and prominent, projecting downward just in front of the mandibles. Outwardly, near the front margin at about the middle, there is a slender spine. Near the apex of the maxillæ there is a group of coarse setæ. The mandibles are large, stout and prominent, concave on the inner side and with six long, stout, curved teeth on the apical margin; on the outer surface there is a coarse spine inserted above the teeth. At the base, on the inner surface, is inserted a dense tuft of long hairs. The labial palpi are represented by tubercles bearing a stout, long spine.

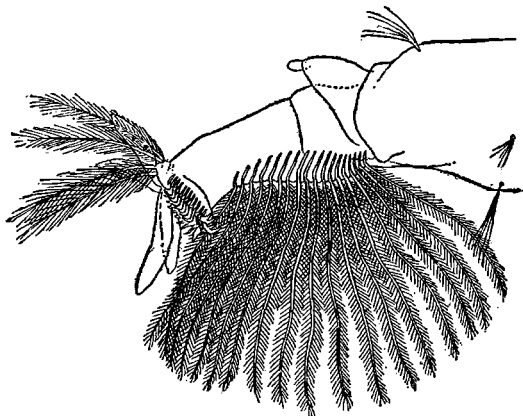


FIG. 7.—*Sayomyia punctipennis*: Terminal segment of larva.

The thorax is elongate, hexagonal; the three segments fused. The air-vesicles, at its posterior third, are short and rounded, obtusely pointed in front. First abdominal segment shorter than the succeeding ones. Air-vesicles of the seventh abdominal segment small, rounded. Thorax and abdomen with several series of delicate, white, sensory hairs, mostly stellate. Basally a portion of the ninth abdominal segment is strongly constricted off into what appears to be a short, distinct segment; projecting over this, from the hind margin of the eighth segment, like a hood, is a triangular fleshy flap with its tip prolonged into a knob. Anal segment (fig. 7) elongate and slender; on each side, close to the posterior margin, a very regular row of strongly curved spines, about twelve in each row; below these are the ventral hooks which are short and each with two nearly equal teeth. Ventral rudder of 18 or 19 long, coarse, unbranched ciliate hairs. The four anal gill-flaps are rather small, elongate. Dorsally the anal segment bears at its tip two long, straight, plumose setæ, and curving over these another pair of plumose hairs.

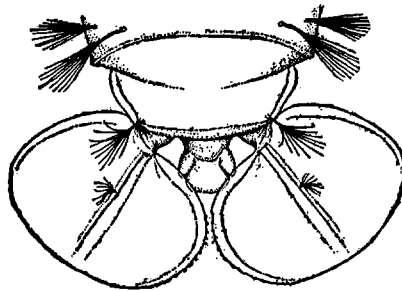


FIG. 8.—*Sayomyia punctipennis*: Tip of abdomen of pupa.

Pupa.—Length about 7 mm. Thoracic portions short and globose, the abdomen long. Eyes large, emarginate for the superiorly inserted antennæ. The trumpets large, broadest at the middle and tapered to the base and apex; surface coarsely reticulate; apical opening very minute. The abdominal segments with long, stellate, colorless, sensory hairs at the sides near

the posterior margin. Paddles (fig. 8) broader than long, inserted well apart and directed obliquely outward; the approximating margins with minute serrations.

The pupa floats below the surface of the water and maintains itself in a perpendicular position, the abdomen extended straight downward. When disturbed it darts about by strokes of its abdomen with amazing rapidity. The pupa, like the larva, is colorless. The air bladders of the anterior pair are distinctly visible in the pupa, in the lower part of the thorax, but they are not pigmented. When the larva approaches the pupal period the pigment spots of the air-vesicles break into irregular groups, leaving spaces between them, and the pigment is probably removed in the process of pupation.