

These fragments consisted in great part of half-eaten scales, from which the eggs and the Coccids had been extracted.

*Larva*.—The caterpillars are about one-fourth inch long, dark purple in color, with lines of lighter color in fine blotches along the sides.

*Pupa*.—The chrysalis is sometimes formed upon the branches within a cocoon of silk densely covered with scales, and sometimes concealed in a dead, rolled leaf, or otherwise protected under fragments lodged in spider-webs, &c. It is dark brown in color, and of the usual form, without striking peculiarities.

*Imago*.—The moth is less than one-third inch in length, with rather long wings; head and thorax are ashen gray; the upper wings are lustrous lead color, with silvery scales intermixed; they are marked each with a single distinct black spot near the base and a pair of faint dots near the tip. The under wings are silvery gray, with the membrane showing iridescent blue between the scales in the middle of the wing; the antenna in one sex has the third joint thickened and curiously excised, the excavation covered with a tuft of long scales.

*History*.—The larvae of this species have been observed only in the fall and winter months, and the number of broods is not known. It may be assumed to have three or four broods. Moths appeared in thirteen or fourteen days from pupæ formed late in September. In December and January they remained twenty days in pupæ.

Two other moths of this family (*Encider*) have been noted\* as feeding upon Coccids in Florida, but they were bred only from gall-like Bark-lice found upon Oak, and never occurring upon orange trees.

#### INSECTS OF THE ORDER HEMIPTERA.

THE SPIDER LEGGED SOLDIER BUG (*Leptocorisæ tipuloides*, Latr.; Plate VI, Fig. 4.)—This is a slender, long-legged bug. The color of the body is orange yellow, with a rounded spot of black upon the thorax; the legs, antennæ, and tip of the beak are black; the wings in the adult have a band of black across the middle and an oval spot of black covering the terminal half; the legs are covered with almost invisible, short, stiff hairs, which cause small light objects to adhere to them. The bodies of the young especially are covered with fragments, consisting in great part of the pellicles of insects which have been emptied of their contents by the bug. Length of the adult,  $\frac{7}{16}$  inch.

The habits of this bug are sluggish, but it flies readily when adult. It is found, often in great numbers, upon the Orange and other plants when they are infested with the common Lecanium Scale (*Lecanium hesperidum*, Linn.). The bug sucks the juices of these soft-shelled Bark-lice, but has never been observed to puncture the hard scales of the Diaspidæ. Unfortunately the *Leptocorisæ* does not discriminate between friends and foes, but destroys many predatory and useful insects.

\* Rept. Comm. Agric. for 1879, p. 244.

It has been observed to capture and suck the juices of ants and of the larvæ of the Lace-wing flies, and also to empty of their contents the eggs of other insects.

*Eggs.*—The eggs are long, vial-shaped objects, brick-red in color; they are deposited upright, in small masses, agglutinated with a viscid, frothy substance, which dries very slowly and remains sticky long after the eggs have hatched. The eggs hatch in about one week after they are deposited.

*Life-history.*—The number of broods is indefinite; solitary individuals are found at all seasons, but become more numerous in spring and fall, upon plants infested with *Lecanium* Scale, which also breeds most rapidly at these seasons. The young suck the juices of plants for a short time after hatching, but afterward feed exclusively upon insects. They change their skins frequently, gradually acquiring fully developed wings and other characters of the adult; the process occupying, according to the season and temperature, from three weeks to two months. This species is much more gregarious in its habits than most predatory Soldier-bugs. Not only the young, but also the adult insects are frequently found in large colonies.

*Parasite.*—The only enemy known to attack this bug is a minute Proctotrupid fly, belonging to the genus *Telenomus*,<sup>3</sup> which is bred within, and destroys its eggs. The parasite is black, with yellow legs. A single fly issues from each egg of the bug, leaving a round hole eaten in the side of the shell.

Two small bugs (*Hemiptera*) prey upon the Mealy-bug (*Dactylopius destructor*). Specimens of the young bugs were sent to the Department of Agriculture, from Florida, on leaves of Orange infested with Mealy-bugs, and were observed to suck the eggs and young lice of the Mealy-bug.

In the young of one species the color is deep red, with brown eyes; antennæ and legs pale reddish or yellowish white, with the thighs slightly dusky; the antennæ four-jointed, the fourth joint longest; the proboscis short, rather stout; from each side of the abdomen, near the tip, projects a pair of long bristles. Length, when adult, about 3<sup>mm</sup> ( $\frac{1}{10}$  inch).

The other species is a smaller insect than the preceding. The young bugs are coral-red, the shanks and tips of the legs white, the antennæ also parti-colored, having the third joint and tip of the terminal (fourth) joint white; the proboscis is white, and reaches beyond the middle of the body; the body and members are covered with short, pale hairs. The adult is purple-brown, with lighter eyes, and has parti-colored legs and antennæ; the wings are ornamented with a large chocolate-brown spot edged with white or pale red, and situate at the base of the membranous portion, near the tip of each wing-cover; the body and surface of the wings are thinly covered with silvery hairs, giving a hoary appearance to the insect. Length 2.2<sup>mm</sup> ( $\frac{1}{10}$  inch). The egg is long and slender, vase-shaped, pearly white, with a tinge of pink, and has a white rim; it is

Recently Professor Riley has given a more detailed and exact account of the manner by which the act of coition takes place. A portion of his article which was published in the *Scientific American Supplement* of April 3, 1878, and republished in the *Proceedings of the Biological Society of Washington*, Vol. ii, 1882-84, p. 81, is here reproduced:

"We have seen that, by means of the partial elongation of her puparium and her partial extraction therefrom, the female is able to reach with her head to the extreme lower end of her follicle, causing, in doing so, the narrow elastic portion of the follicle to bulge, and the orifice to open more or less, as it repeatedly did while the larva was yet feeding, whenever the excrement had to be expelled. Fig. 94, *a*, shows a follicle cut open so as to exhibit the elongated puparium, and the female extended from it as she awaits the male; *b* represents this degraded female more in detail. A cursory examination of the male shows the genital armature, which is always exposed, to consist of (1) a brown, horny, bilobed piece, broadening about the middle, narrowing to and notched at tip, concave, and furnished with a tuft of dark hairs at tip inside; (2) a rigid brown sheath, upon which play (3) the genital hooks or clasps, which are also concave inside, strongly bifid at tip, the inner finger furnished with hairs, the outer

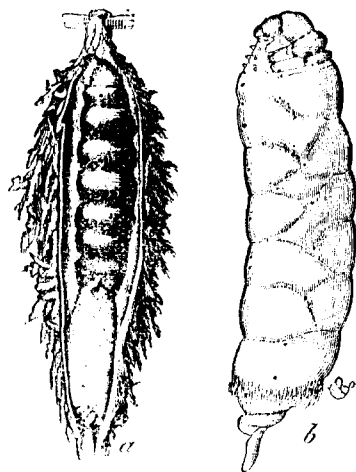


FIG. 94.—*THYRIDOPTERYX EPHEMERIFORMIS*: *a*, Follicle cut open to show the manner in which the female works from her puparium and reaches the end of the bag, natural size; *b*, female extracted from her case, enlarged. (After Riley.)

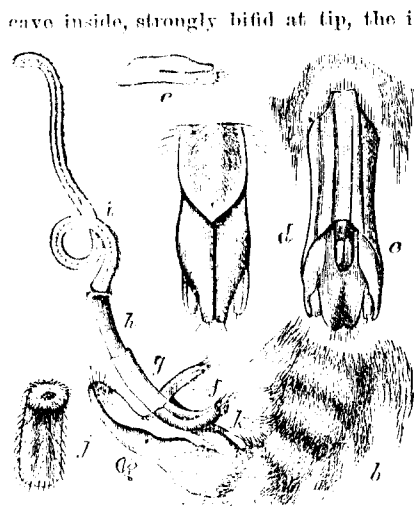


FIG. 95.—*THYRIDOPTERYX EPHEMERIFORMIS*: *b*, The end of male abdomen from the side, showing genitalia extended; *c*, genitalia in repose, ventral view; *d*, do., dorsal view; *e*, tip of bifid clasp; *f*, tip of penis; all enlarged. (After Riley.)

produced to an obtuse angle near tip, and generally unarmed (Fig. 95, *e*). In repose, this armature appears as in Fig. 95, *e*, from beneath, and as at *d*, from above, and is well adapted to prying into the opening of the follicle. The male abdomen is telescopically extensile, while the tip easily bends or curves in any direction, but most naturally beneath, as at *b*, where it is represented enlarged about six times, and with all the genital parts expanded; *k*, the fixed outer sheath; *f*, the clasps; *g*, a pale membranous sheath upon which the preputium (*h*) plays, as on the finger of a glove; *i*, the fleshy elastic penis, armed with retorse hairs, and capable of extending to nearly one-fourth of an inch; *j*, showing the end still more fully enlarged. With this exposition of details, not easily observed or generally understood, the act of fecundation is no longer a mystery."

## NOTES.

---

NOTE 1 (p. 59).—Mr. Howard states that this *Tetrastichus* has never since been bred, and that the material is too poor for determination. April 18, 1885, I bred two additional species of parasites from the Florida *Ceroplastes* at Crescent City, which were determined by Mr. Howard as (1) *Coccophagus viridus* Howard (see Bulletin 5, Division of Entomology, U. S. Dept. Agr., page 24, species 37) which I had previously bred from *Leucanum hesperidum*, on Orange, at Crescent City. (2) A species of *Euclyptus* represented by one ♂ which was mounted in balsam and so badly crushed as to admit only of a generic determination.

NOTE 2 (pp. 69 and 77).—In looking up the saved material in order that this species might be determined, but a single crippled and inferior specimen was found, and Professor Riley prefers not to describe it for the present from this unsatisfactory specimen.

NOTE 3 (p. 79).—This parasite was handed to Mr. Howard, who has given me the following concerning it:

"While at first glance I determined the *Leptocorisæ* egg-parasite for you as a species of *Telenomus*, a more careful subsequent study, and a comparison with a number of Mayr's types of this genus, show that it belongs rather to the allied genus *Hadronotus* of Foerster. The great majority of the species of the subfamily Scelionina, to which these two genera belong, are egg-parasites. This species may be described as follows:

"*HADRONOTUS LEPTOCORISÆ* n. sp.

"*Female*.—Length, 1.4<sup>mm</sup>; expanse, 2.5<sup>mm</sup>. Head and face evenly covered with small round punctures, except in the facial impression, which is transversely striate; antennæ subclavate; lateral ocelli nearly touching the margins of the eyes. Mesonotum a trifle smoother than the head and furnished with a very fine white pubescence. First segment of the abdomen dorsally longitudinally striate; remaining segments closely covered with fine round punctures; ventral surface sparsely punctate. Color, black; scape, brown; all coxæ, black; all trochanters, femora, tibia, and tarsi, light brown; mandibles and wing-veins, light brown.

"*Male*.—Length, 1.3<sup>mm</sup>; expanse 2.8<sup>mm</sup>. Antennæ filiform. In other characters resembling the ♀."

"Described from many ♂ and ♀ specimens, bred from the eggs of *Leptocorisæ tipuloides*, at Crescent City, Fla., by H. G. Hubbard."

NOTE 4 (p. 80).—These bugs belong to the genus *Rhinacloa*, but the species is undetermined.

NOTE 5 (p. 81).—This species is so far undetermined. It is a beautiful and well-marked species, the prevailing color being brown. The mesoscutum has two yellow stripes converging posteriorly, the mesoscutellum is entirely yellow, the metascutellum is marked with yellowish, and the abdomen has yellow rings.

Just as these notes are going to press, I am able to add the following concerning this species, received from Mr. Cresson:

"The specimen arrived minus its abdomen, but judging from what is left it seems to belong to the genus *Hemiteles*. I have looked over the material belonging to that