

8. Third cubital cell *larger* than the second, the second and third each receiving a recurrent nervure; clypeus not prominent, with a slight triangular emargination or impression anteriorly; apical tooth of mandible much longer than the two inner teeth; maxillary palpi 6-jointed, labials 4-jointed (South America)... Telephoromyia, Guérin.
(Type *T. rufipes*, Guér.)

Third cubital cell *shorter* than the second; clypeus not produced, excised anteriorly; maxillary palpi 6-jointed, joints 1-3 short, 4-6 very long; labial palpi 4-jointed..... Aelurus, Klug.

9. Clypeus somewhat produced, the anterior margin subarcuately emarginated, the labrum more or less exposed, ciliated; maxillary palpi 6-jointed, first joint of flagellum shorter than the second (Australia)..... Lophocheilus, Guérin.
(Type *L. villosus*, Guér.)

THE LARVA AND PUPA OF THE APPLE BUD-BORER

(*Steganoptycha pyricolana*, Murt.).

BY E. DWIGHT SANDERSON, AGRICULTURAL COLLEGE, TEXAS.

In studying the larva and pupa of *Steganoptycha pyricolana*, Murt., some observations were made as to structure, which it seems desirable to permanently record. The life-history and habits of the species have been described in the Twelfth Report of the Delaware Agricultural Experiment Station.

"This species was described by Miss M. E. Murtfeldt, in Bulletin No. 23, o. s., Div. Ent., U. S. Dept. Agr., p. 52, as *S. pyricolana*, Riley MS. Concerning the identity, it was stated that 'Professor Fernald, to whom a specimen was shown, considers it identical with Clemens's *S. salicicolana*, which, I believe, breeds in willow galls, but Dr. Riley pronounces it distinct, and he has types of Clemens's species.' My specimens agree entirely with Miss Murtfeldt's description, but are distinctly different from Clemens's types in the collection of the Am. Ent. Society. Correspondence shows that the opinion credited above to Dr. Fernald is incorrect, as he never compared the specimens. Dr. Fernald, to whom specimens were referred, has kindly given the identity of the species considerable attention, and writes me that he has frequently received speci-

mens from various parts of the country, where the larva has been boring in rose. He also states that there is probably no doubt as to my specimens being the same as Riley's *S. pyricolana*.

"Miss Murtfeldt found the larva damaging apple terminals in Missouri in August and September, 1890, and gives an excellent description of the larva and moth. This is the only published reference to the species so far known.

"*Larva*.—5 x 1.25 mm. Elongate, sub-cylindrical; colour from a dirty cream to light yellowish-brown, tinged with pinkish dorsally—usually giving it quite a rose colour, tubercles grayish, spiracles brown; head slightly narrower than prothorax, metathorax to 7th abdominal segment of same width, thence tapering sharply caudad; head shining, front cinnamon brown, sutures darker with blackish line, an indefinite caudo-mesal area slightly darker and a similar darker shade on each dorso-lateral surface caudally, joining on caudal margin under pronotum; labium and maxilla body colour, sutures of under side of head dark, palpi and antennæ light, latero-ventral sutures of head black, ocelli black, forming a short black bar extending caudo-dorsad back of antennæ, labrum dark brown; abdominal segments with two and thoracic with three annulæ; pronotum chitinous, straight, cephalic margin covering caudal part of head which is visible beneath, caudal margin curved, surface shining; legs with basal suture in front dark, otherwise concolorous; tips of prolegs dark brown; the 8th abdominal segment, especially on the caudal annulet, giving it a darker, olive colour, the 9th abdominal targite chitinous, shiny, olive colour; caudal setæ prominent, long as the ninth segment; anal prolegs cylindrical, reaching to the tip of the ninth segment, brown at tips; four or five stiff brown setæ above anus; segments of abdomen rather longer caudally."

Larval Mouth-parts.—The under side of the larval head is shown in figure 4. I have been unable to homologize the sclerites at the base of the labium and maxillæ; *ca* is evidently the cardo of the maxilla, in two parts; *c* may also be a part of the cardo; *a* and *b* may form one sclerite, though there is a distinct suture between them; *d* forms a band connecting *h* on either side (this same sclerite is found in Coleopterous larvæ, and seems to be the ventral sclerite of a head segment); *e* is membranous, and in it lie chitinated sclerites *g* and *f*. From *g* the occiput (?) *i*' runs dorsad, the portion *i* of the figure being the break caused by the detachment of *i*' from *j* on the slide; *j* is distinct from *h*, and caudally there is a distinct suture

at x , separating it from the dorsal portion of the head. The dotted line extending in front of the ocelli is hypothetical, but traces of it can occasionally be distinguished in other larvæ, and the separation of these two ocelli from the others indicates it. The long band with enlarged ends, marked k , lies within the head above the maxilla and is strongly chitinized.

I call attention to these different parts for the purpose of pointing out the necessity for the study of the sclerites of the larval head. I have consulted several specialists of Lepidopterous larvæ without securing any information as to the identity of these parts. I have found the same difficulty in Coleopterous larvæ. Certainly these parts possess more or less taxonomic value, and it seems to the writer that we err if we fail to delineate and describe them in the description of larvæ. But as long as we have no terminology, this is difficult and will probably be neglected by most students. Studies are certainly needed along this line.

Pupa.—Described from cast skins and one specimen nearly ready to transform.

5.5 x 1.3 mm.; deep orange brown; head, thorax and exposed portions of appendages blackish; spines on abdominal segments tipped with black; setæ light; thorax and first abdominal segment without dorsal spines; second abdominal segment with caudal row of spines; third to seventh abdominal segments with spines, as in Fig. 5; eighth to tenth, as in the figure; segments one to six subequal in length; seventh shorter; eighth to tenth, adnate; eighth and ninth together as long as sixth, tapering caudad from fourth segment. In the figure x marks a break between a and b in the cast skin from which drawn. Concerning the identity of sclerites a and b , I am in doubt.

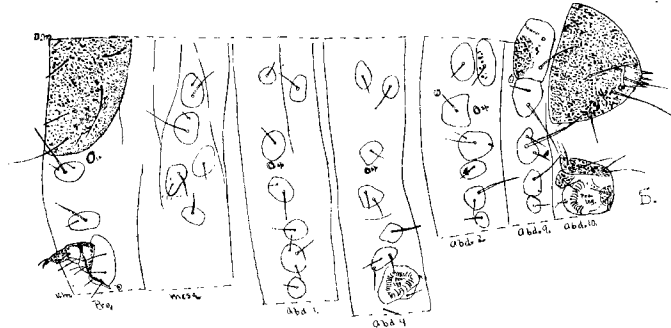


FIG. 2.

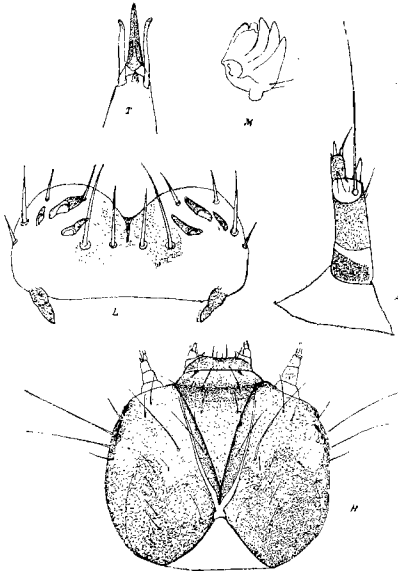


FIG. 3.

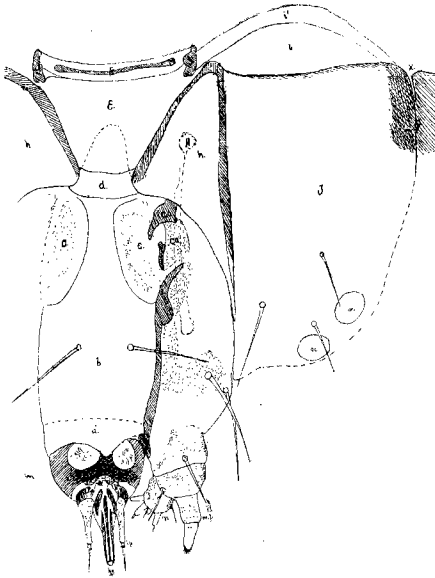


FIG. 4.

EXPLANATION OF FIGURES.

Fig. 2.—Tubercles of larva of *Steganoptycha pyricolana* diagrammed; *d. m.*, dorso-meson; *v. m.*, ventro-meson; *pro.*, meso, pro and meso-thorax; *abd. 1-10*, abdominal segments, 1 to 10; *sp.*, spiracle.

Fig. 3.—Larval mouth-parts of *Steganoptycha pyricolana*: *l*, labrum; *m*, mandible; *a*, antenna; *h*, dorsal aspect head; *t*, tarsus; all enlarged.

Fig. 4.—Ventral aspect of head of larva of *Steganoptycha pyricolana*, enlarged; for discussion of parts, see text.

Fig. 5.—Pupa of *Steganoptycha pyricolana*; *a*, dorsal aspect 4th abdominal segment; *b*, dorsal aspect 8-10th abdominal segments.

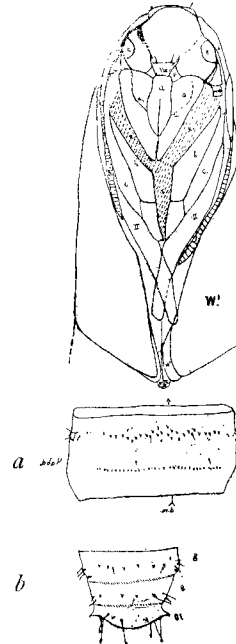


FIG. 5.