

THE LIFE HISTORY OF *HERCULIA PHÆZALIS*
(PYRALIDINÆ)

by JOHN ADAMS COMSTOCK

This species was originally described by DYAR (*Proc. Ent. Soc. Wash.* 10: 108; 1908) from 13 examples: "Los Angeles Co., May, (A. Koebele); Los Angeles Co., Cal., (D. W. Coquillett); Santa Monica, Cal., (J. J. Rivers)." He noted that "Mr. Koebele's specimens are labeled old branches of *Cupressus* and fresh bark of orange." Dr. E. O. ESSIG (*Pan-Pacific Ent.* 1: 93; 1924) reports the species "taken in destructive numbers on Monterey Cypress at San Diego, California, June, 1924. The twigs were attacked and the cocoons, which occurred abundantly, were covered with frass and dead leaflets."

The Los Angeles County Museum collection contains examples collected at Santa Barbara, California, by CARL KIRKWOOD.

I first encountered *H. phæzalis* as larvæ in 1937, feeding on dead leaves of Lombardy Poplar, in Los Angeles. The leaves were held in an isolated crotch of the tree, and no damage to the bark or adjacent foliage was noted. Several examples were reared to maturity in the decomposing material after it was removed.

This year (1959) in Del Mar, California, I observed a large number of moths hovering over a compost heap which I had built up from dead leaves and small twigs of Monterey Cypress, Torrey Pine, Tecate Cypress, Eucalyptus, and *Adenostoma*.

This heap of rotting vegetation was not in contact with any living plant tissue. It represented three or four years of accumulation, and was heavily infiltrated with molds (fungi). It yielded large quantities of cocoons and many larvæ. The majority of the cocoons contained pupal cases that had given forth imagines in previous seasons, but a good percentage had viable pupæ.

From this investigation it was apparent that *Herculia phæzalis* is primarily a feeder on dead and rotting vegetation, including many species of plants, and that the reports of its damaging bark and live twigs was incidental to occasional close contact of infested compost with live plant tissues.

The larval habits and activities of *H. phæzalis* are apparently similar to those reported by DETHIER (*Can. Ent.* 74: 6-7; 1942) for a related species, *Herculia intermedialis* Wlk. *H. phæzalis* larvæ form fragile runways of loose silk mixed with frass, along which they travel, back and forth, while feeding. When disturbed, they wriggle backward, and drop on a strand of silk. They can be easily recovered by agitating the compost mass over a metal screen ($\frac{1}{4}$ inch mesh).

EGG: Length approximately 0.75 mm. long by 0.5 mm. wide. In form, it is regularly oval. The entire surface is covered by an irregular reticulation. The color is lustrous pearl-white.

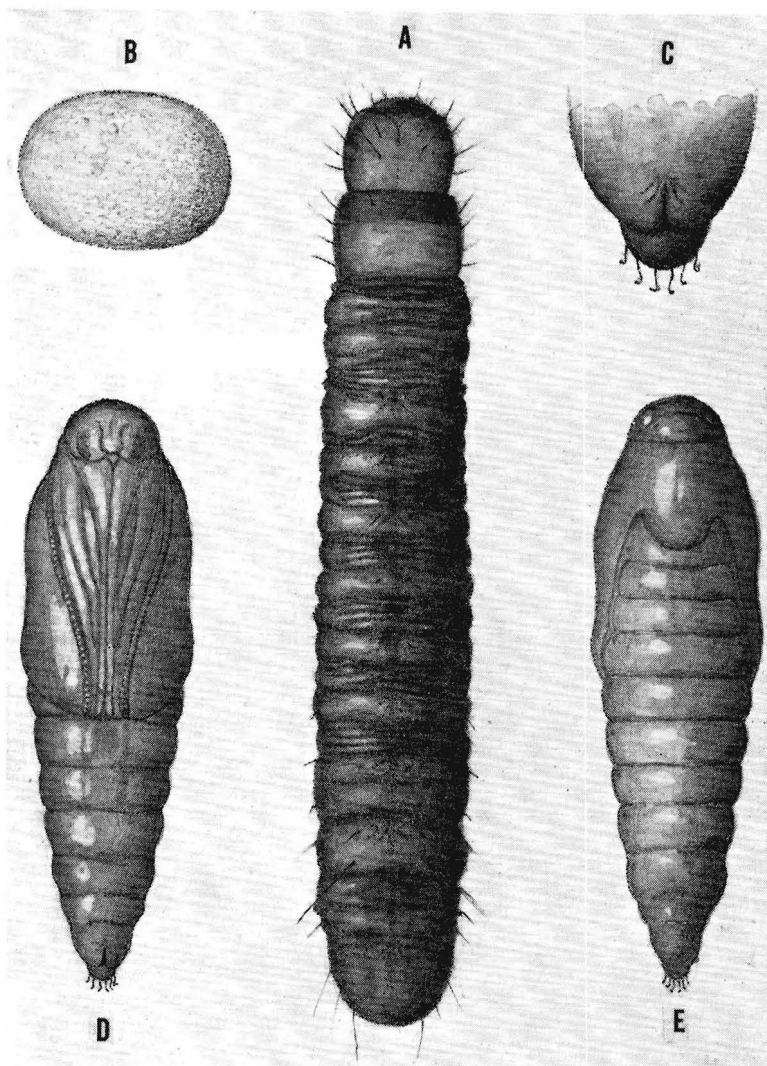


Fig. A. Mature larva, dorsal aspect, enlarged $\times 9$. Fig. B. Egg, enlarged approximately $\times 45$. Fig. C. Cremaster in ventral aspect, enlarged approximately $\times 35$. Fig. D. Pupa, ventral aspect, enlarged $\times 10$. Fig. E. Pupa, dorsal aspect, enlarged $\times 10$. [Drawing by the author.]

MATURE LARVA: Length 15 mm. Head width 1.5 mm. The larval body is cylindrical, the head and first thoracic segment being slightly flattened and smooth, and somewhat narrower than the remaining segments.

The color is predominantly brownish-black, with a slightly lighter shade on the head and first segment, and a faint blotching of soiled yellow on the caudal area. There is a suggestion of a narrower longitudinal middorsal black stripe with an indefinite marginal band of a lighter shade, more noticeable on the caudal segments.

All of the body segments, except the head and first, are thrown into numerous transverse ridges and folds that are difficult to describe, but are accurately illustrated on the plate.

The legs are dull yellow, with black segmental junctures. The prolegs and anal prolegs are dull yellow, and the crochets, hyaline.

The spiracles are inconspicuous, and concolorous with the body.

The setæ are light yellow-brown.

PUPA: Length 7 mm. to 11 mm.; width, 2 mm. to 3.1 mm. The female pupæ are noticeably larger and more robust than the males. In shape, they are fusiform, with evenly rounded heads, and abdominal segments gradually tapering to a smaller rounded cauda. The antennæ extend to the distal margins of the wings, and the maxillæ are slightly shorter. The eyes are small, slightly protruding, and relatively close together. The spiracles are minute and inconspicuous. The cremaster is a rounded button, tipped with six recurved hooklets, in line latero-laterally, the longest about 0.1 mm. The hooklets recurve laterally.

The color of the pupa is a uniform glistening light yellow-brown, except for the darker eyes and tip of the cauda.

Herculia phæzalis being primarily a feeder on decomposing vegetation plays an important and beneficial role in converting this waste into fertilizer.

Possibly the occurrence of molds in the compost is a factor in their nutritional requirements.

Preserved larvæ and pupæ, and reared imagines, will be deposited in Peabody Museum of Natural History of Yale University.