



## IMMATURE STAGES OF *ESTIGMENE ACREA* FROM GUATEMALA (LEPIDOPTERA: ARCTIIDAE)

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**ABSTRACT:** The immature stages of *Estigmene acrea* Drury are described and figured. The larval host utilized was *Brassica oleracea* L. var. *botrytis* (cauliflower).

**KEYWORDS:** Guatemala, Chimaltenango Department, fasciated inflorescence, agricultural pest.

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*Estigmene acrea* Dury, 1773 is a well known Tiger Moth that ranges from southern Canada to Honduras. It's common name, Saltmarsh Caterpillar, disguises the fact that it is a well known polyphagous agricultural pest. Nonetheless, it is found very sporadically over this wide range and is generally not often thought of as a "pest species" among lepidopterists. <http://www.npwrc.usgs.gov/resource/distr/lepid/moths/usa/1824.htm> is the link to its USGS range map.

The immature stages in this study are from the southwest side of the town of Tecpan, Chimaltenango Department, Guatemala. This location is an agriculture area with many farms at an elevation of 2330 meters. A farmer gave the author two cluster of ova – one had 54 eggs and the other had 36 eggs. The eggs had been oviposited on leaves of cauliflower (*Brassica oleracea* L. var. *botrytis*) which was then utilized in rearing the larvae for this study.

### MATERIALS AND METHODS

**Rearing:** Cauliflower is easy to obtain in grocery stores and markets. Most of the leaves of the cauliflower were cut from the stem. The stem of the cauliflower was placed into a small container with some water and the gaps between the stem and the container were plugged with wads of plastic. The cauliflower was then placed into a gallon size plastic container. The container had a lid of chiffon material to allow for some air circulation and avoid moisture accumulation.

The leaves the ova were on were trimmed to nearly the size of the egg cluster. When the eggs began to hatch the clusters were placed on the cauliflower. The larvae could easily find the fresh plant. When the larvae were small, a container of cauliflower was used for each cluster. When the larvae were large, about 15 were put into a container. They appeared to be somewhat crowded but that didn't seem to be a problem. From the second instar on, each time the larvae molted they were transferred to a fresh head of cauliflower. Those larvae utilized for measurements were measured for length before being disturbed, then they were placed in a separate container to molt. This made the head capsule easy to find, especially during the small instars.

**Observations:** Morphological observations and measurements of the ova, first instar larvae, and head capsule were made with the aid of a stereomicroscope and a 0.1 mm scale. Measurements of second instar larvae and larger, and the pupae were made with a millimeter scale. Measurements of the head capsule width were made of the molted head capsule. Measurements of the length of the larvae were made when the larvae had stopped eating and were preparing to molt. Maximum length of the sixth instar larvae is given for the mature larvae in the most common resting position. N=10 for all of the measurements.

## DESCRIPTION

**Eggs:** Eggs are light blue, smooth, and spherical with a diameter of 0.6 mm.

**Larvae:** The larvae have six instars.

**First instar:** Neo-natal larvae: 1.8 mm long. Head: black with black hairs and a light brown triangle just above mouth. Body: creamy white, each segment with five black spots on each side; a long black hair arises from each spot, each black spot on first segment has two hairs; a large black spot above anus; light brown areas on each segment; thoracic legs: black and white. Length: 3.8 mm (range: 3.6 to 4.0); width of head capsule: 0.41 mm (range: 0.40 to 0.43).

**Second instar:** Similar to the first instar. Length: 6.6 mm (range: 6.2 to 7.0); width of head capsule: 0.56 mm (range 0.55 to 0.58).

**Third instar:** Similar to the first instar except that each spot has several hairs. Length: 10.7 mm (range: 10.0 to 11.5); width of head capsule 0.91 mm (range 0.84 to 0.97).

**Fourth instar:** Head: black with black hairs, eyes white; frontoclypeus light brown or creamy, somewhat transparent on the molted head capsule. Body: creamy white with brown areas that form a marbled wide stripe on each side of mid-dorsum; marbled brown laterally and underneath, some individuals appear more brown than others; creamy white diagonal stripe on each segment from middle of body down to legs, this diagonal stripe is also on the fifth and sixth instars and barely apparent on the third instar; the spots give rise to many hairs; two spots closest to mid-dorsum are black, others are creamy white or light brown; some hairs black, some light brown, and some white. Length: 17.1 mm (range: 16.0 to 18.0; width of head capsule: 1.56 mm (range: 1.48 to 1.58).

**Fifth instar:** Head: similar to fourth instar. Body: primarily black marbled with white, each segment with six bumps on each side, the two bumps nearest mid-dorsum are black, others light brown; posterior two segments have one less bump; each bump gives rise to many hairs which most are light brown and some are black. Length: 26 mm (range: 25 to 27), width of head capsule: 2.41 mm (range: 2.34 to 2.47).

**Sixth instar:** Similar to fifth instar except body somewhat darker, still marbled. Some larvae have mostly reddish brown hairs, others mostly black hairs. Length: approximately 45 mm; head capsule data not obtained.

**Pupae:** Primarily cylindrical, rounded on both ends with a sharp point on the posterior end, and dark brown. Length: 19.5 mm (range: 18.5 to 21); diameter 8.5 mm (range: 8 to 9)..

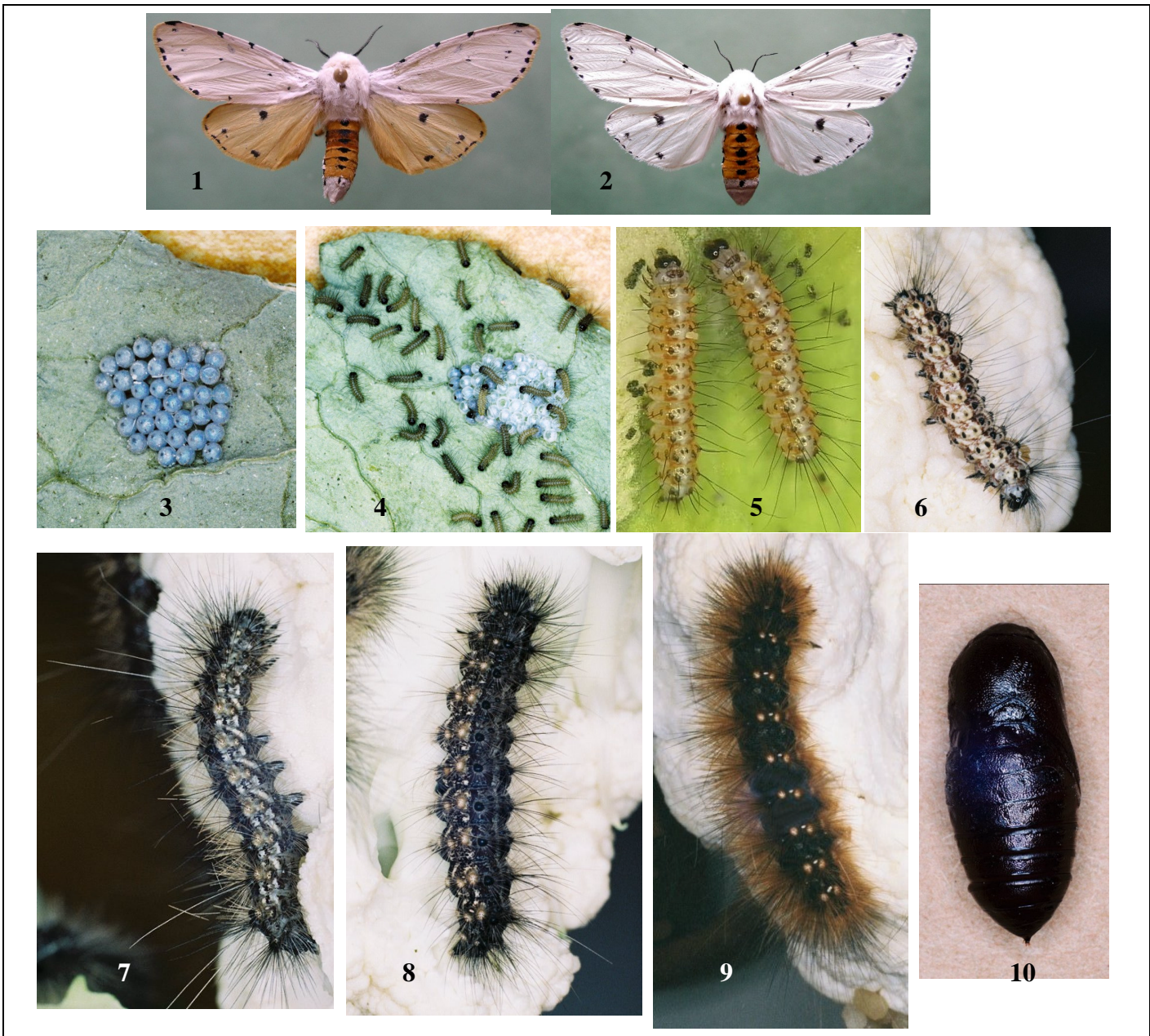
**Behavior:** Larvae eat the fasciated inflorescence and leaves, but seem to prefer the inflorescence. Third instar larvae wander around to find a place to molt. Thus, it appears they are gregarious for the first and second instar and solitary for the third through sixth instars. However, the larger instars did not have a problem being with other larvae. Hairs of the last instar are loosely formed around the pupa, and may also be loosely attached to a substrate.

## RESULTS

The eggs hatched on December 10, 2004. Each instar took 3-4 days to complete except the sixth instar which took 10 days to pupation. The adults started emerging on January 17, 2005 with sixty-eight adults obtained.

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**Figures 1-10.** Developmental stages of *Estigmene acrea*. **Fig. 1.** Male: from rearing. **Fig. 2.** Female: from rearing. **Fig. 3.** Egg mass. **Fig. 4.** Eggs mass with emerging first instar larva. **Fig. 5.** Second instar larvae. **Fig. 6.** Third instar larva. **Fig. 7.** Fourth instar larva. **Figs. 8.** Fifth instar larva. **Fig. 9.** Sixth instar larva. **Fig. 10.** Pupa. All photographs by Jack Harry. Figs. 1 & 2 enlarged.