

DESCRIPTION OF THE MATURE LARVA AND NOTES ON
HOLOCHROA DISSOCIARIA (HULST)
(GEOMETRIDAE: ENNOMINAE)¹

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ABSTRACT. The mature larva of *Holochroa d. dissociaria* is described, with illustrations and photographs included. Notes on the life history are given, and related genera discussed.

Holochroa dissociaria (Hulst) (Figs. 13-14) inhabits the mountainous regions of the southwestern United States. The nominate subspecies occurs in Arizona and Colorado. Subspecies *varia* Rindge is known from New Mexico and western Texas. Three Mexican species also are recognized (Rindge, 1961, 1971).

Holochroa belongs to the Nacophorini, a new world tribe of 21 genera (Rindge, 1971; Ferguson, 1982). Rindge (1974) divided the tribe into a compact nominate group and a diverse nonnominate group. Of the four genera in the nominate group, *Nacophora* is more specialized and *Betulodes* and *Thyrintaina* more primitive than *Holochroa* on the basis of adult characters, but *Holochroa* is considered to be the most distantly related of these genera (Rindge, 1961). In the Nacophorini, only the larvae of *Nacophora*, *Ceratomyx* and *Aethaloida* have previously been studied.

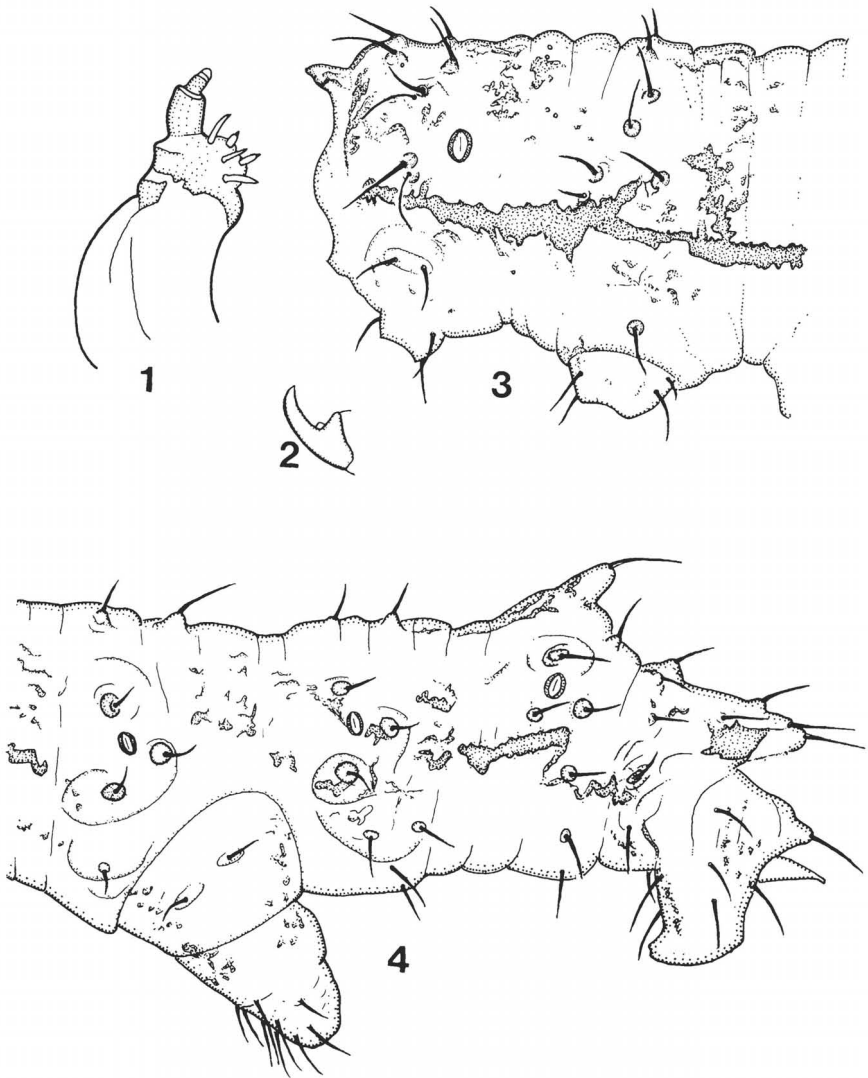
MATERIALS AND METHODS

Nine mature larvae were examined. These were reared on juniper from single females collected at the following localities in Arizona: Walnut Canyon 6500', 6½ mi, ESE of Flagstaff, Coconino Co., July 16, 1965, R. W. Poole, five specimens on *Juniperus* spp.; Onion Saddle 7600', Chiricahua Mtns., Cochise Co., July 16, 1967, J. G. Franclemont, four specimens on *Juniperus pachyplaea* Torr.

Descriptions and drawings are based on these specimens. A Wild M-5 microscope and drawing tube attachment were used in making the illustrations. The larval photograph was taken by Dr. J. G. Franclemont, Department of Entomology, Cornell University. Adult photography and larval illustrations were done by the author. Measurements are based on the average of the available specimens.

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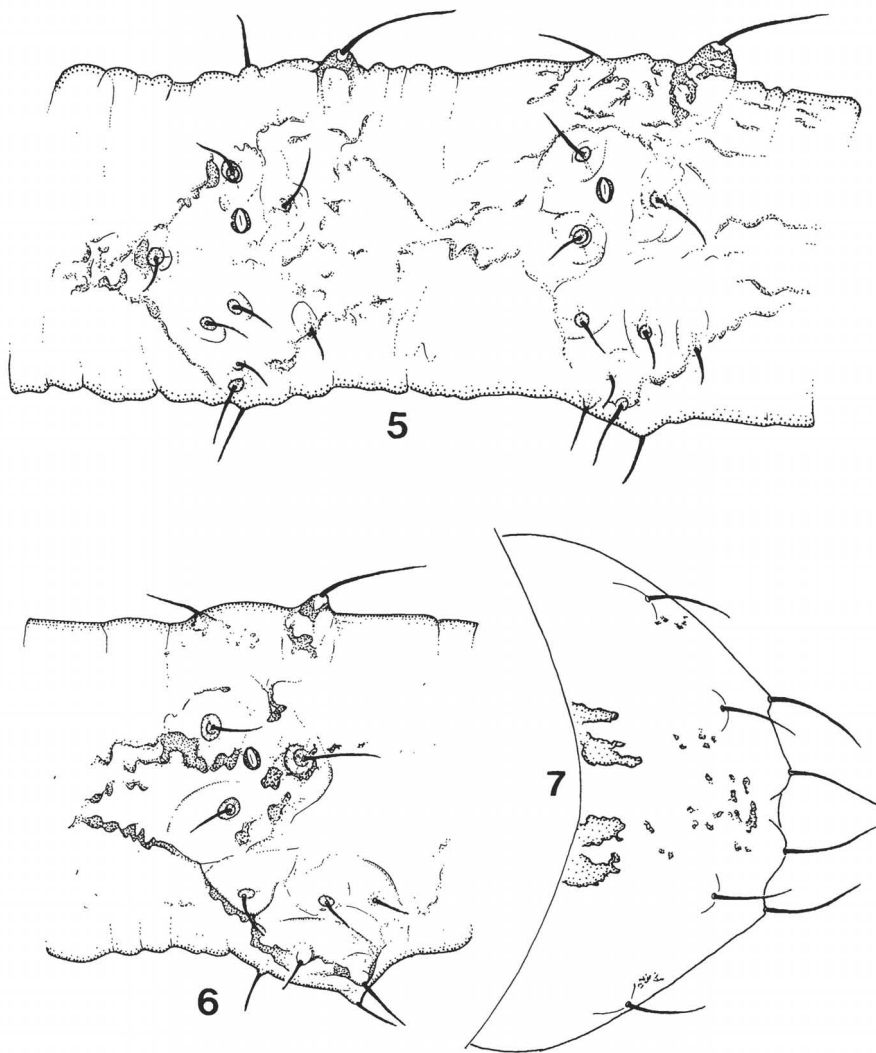
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FIGS. 1-4. Larva of *H. dissociaria*. 1, dorsal view of maxilla, 60 \times ; 2, thoracic leg claw, 60 \times ; 3, lateral view of pro- and mesothorax, 30 \times ; 4, lateral view of abdominal segments 6-10, 30 \times .

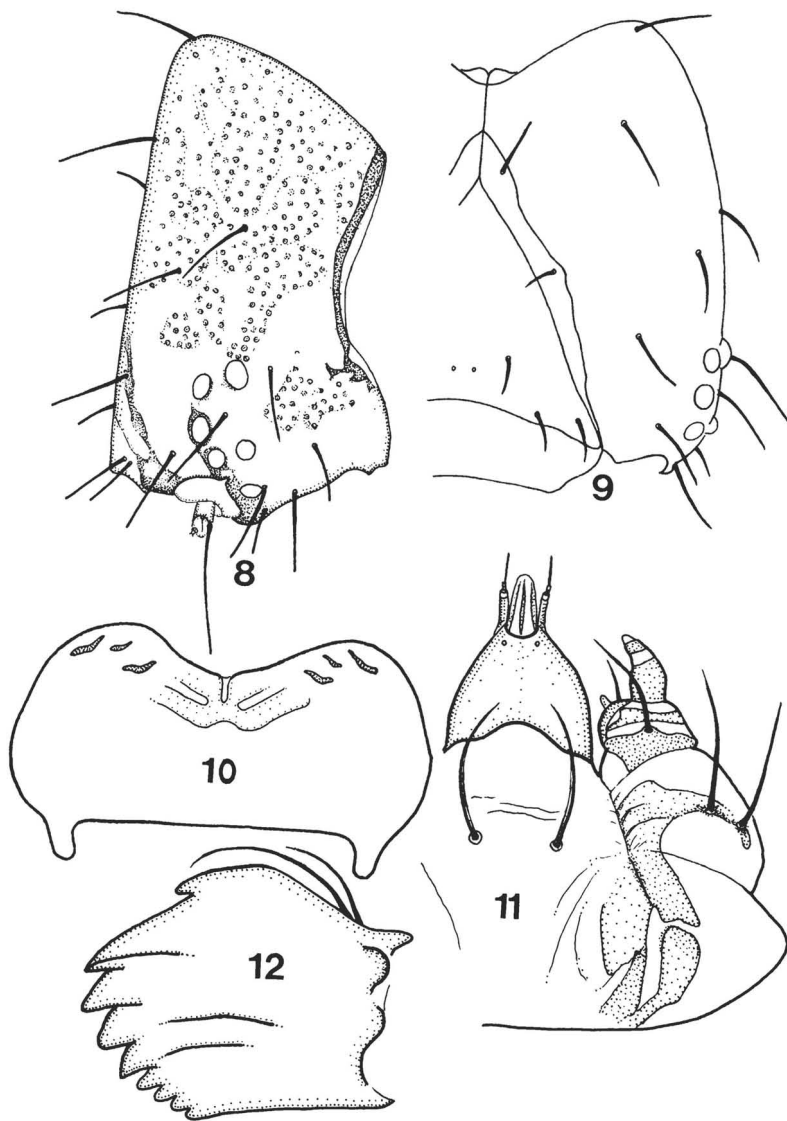
DESCRIPTION OF MATURE LARVAE

Head. Height, 2.7 mm; width, 2.5 mm; color mainly gray above ocelli due to compounded areas of epidermal pigment, cuticle otherwise light brown, with dorsal cream areas of prothorax extending onto top of head, prominent dark sclerotization on collar, about ocelli, in stripe through seta A2 and as a few irregular, small patches (Fig. 8); cuticle rugose and coarsely granular; shape strongly bifid (Fig. 9); ocellus 1 largest, 4



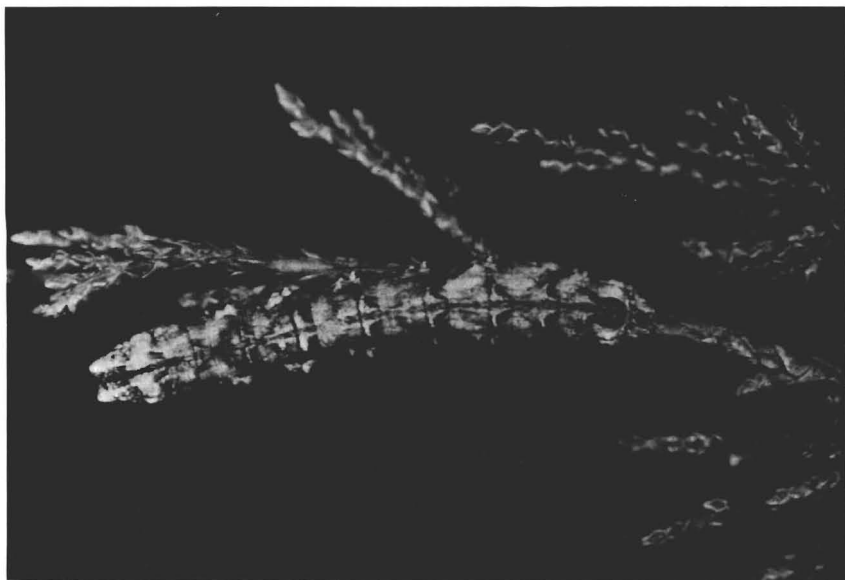
FIGS. 5-7. Larva of *H. dissociaria*. 5, lateral view of abdominal segments 1-2, 30 \times ; 6, lateral view of abdominal segment 3, 30 \times ; 7, anal plate, 60 \times .

smallest (Fig. 8); antennal base with emargination between ocelli 4 and 5 (Fig. 8); mandibles with four large and five small teeth (Fig. 12); more apical mandibular seta twice length of other (Fig. 12); labrum strongly bilobed (Fig. 10); epipharynx with outer pair of heli slightly larger than inner pair, middle pair much smaller (Fig. 10); postmentum with pair of very long setae (often asymmetrical) (Fig. 11); hypopharynx heavily sclerotized; spinneret tube-shaped, slightly tapering apically (Fig. 11); labial palps long and narrow, almost length of spinneret (Fig. 11); posterior side of each maxilla with four prominent setae, most apical one smallest (Fig. 11); terminal lobe of maxilla with three setae and two papillae, most distad of each largest (Fig. 1).



FIGS. 8-12. Larva of *H. dissociaria*. **8**, lateral view of head, 40×; **9**, frontal view of head, 40×; **10**, epipharynx, heli and labral shape, 60×; **11**, ventral view of mentum, hypopharynx, labial palpi, spinneret and maxilla, 60×; **12**, inner view of right mandible, 60×.

Body. Length, 51 mm; width, 4.8 mm; pattern and coloration complex, individually variable (Fig. 13); integument finely granular, several grains equaling width of one seta; setae light brown, most arising from prominent chalazae: D2, L1 and SV1 largest on anterior abdominal segments (Figs. 5-6). **Dorsal view:** thorax variably patterned

**13****14**

FIGS. 13, 14. Larva of *H. dissociaria*. **13**, dorsal view of mature larva, Walnut Canyon, Ariz., 1.5 \times ; **14**, adult male, Walnut Canyon, Ariz., 3.5 \times .

with different shades of gray and cream, with strong mesial sculpturing, particularly on prothorax; metathorax with reddish brown and gray replacing cream. Abdomen variably patterned with different shades of gray, cream and reddish brown, the cream most obvious between D2 setae, red most obvious on segments A1, A3 and A4 (strongest); pattern with diffuse, gray mid-dorsal stripe variably forking anteriorly and posteriorly on each segment, anterior fork usually stronger; forks usually meeting intersegmentally to form variable, diamond-shaped configurations of light color; horseshoe-shaped black mark on A8 with open end anteriorly directed; largest D2 tubercle on A2. **Lateral view:** thoracic coloring like that of dorsum; strong black subspiracular stripe across pro- and mesothorax (Fig. 3), basically gray below stripe and cream above; metathorax with cream centrally and suffused red and gray dorsally and ventrally. Abdomen colored similarly with red most obvious on A1, A3 and A4 (strongest); variably oblique gray and black lines or patches (exocuticular sclerotin), cream on centrally located patches between gray most obvious on A1, A2, A3 and A6, least on A4, prolegs cream colored laterally; largest L1 and SV1 chalazae on A3; peritreme black, spiracular valve pink; hypoproct longer than paraprocts. **Ventral view:** thorax variably patterned with different shades of gray and cream; leg bases increasing in size by twice that of preceding segment; thoracic leg claw dark brown, pointed, with pad in hook (Fig. 2). Abdomen with intrasegmental diamond-shaped patches outlined by gray but filled principally with red and gray in varying amounts; crochets in completely formed biordinal meseries, 41–45 in number on ventral proleg.

Chaetotaxy. **Head:** P1 and P2 rising with apical extension of each side of head (Figs. 8–9). **Abdomen:** extra SV seta on A1–6 (Figs. 4–6), migrating posteriorly on A1–3 (Figs. 5–6); SV3 seta usually bisetose or rarely trisetose on A6 (Fig. 4); remaining SV setae on A6 numbering from 9–11 (Fig. 4), in most geometrids these number 4–5; L1 seta nearly twice length of other L setae on A1–5 (Figs. 5–6); D2 seta about twice length of D1 on A1–6 (Figs. 5–6); anal plate with D2 and L1 setae slightly larger than D1 and SD1 setae (Fig. 7).

DISCUSSION AND NOTES

The mature larva is unusual in having the extra SV seta on A1–6. Designating the affinity of the extra seta to the SV setal group appears most accurate, since it migrates closer to the SV3 seta on each progressive segment and is apparently the extra seta contributing to the bisetose condition of SV3 on the ventral proleg (an L group seta would not be found here). Examination of four available *Nacophora* species, *belua* (Rindge), *cristifera* (Hulst), *mexicanaria* (Grote) and *quernaria* (J. E. Smith), revealed that the chaetotaxy of these larvae is almost identical to *H. dissociaria*. Numerous studies have been made on *N. quernaria* with no mention of the extra seta. However, McGuffin (1967) did note the extra seta (referred to as the LX seta) in *N. kirkwoodi* (Rindge). He also stated that this extra seta is not present in the first instar larva. *Nacophora* larvae are most readily separated from *Holochroa* by the presence of body papillae and microspurs, ventral branching filaments on A6–9 and larger chalazae.

McGuffin (pers. corr.) describes the chaetotaxy of *Gabriola* as being similar to that of *Nacophora*. Examination of mature larvae of *Ceratomyx arizonensis* (Capps) and *C. permagnaria* (Grossbeck) showed no extra seta. Larval specimens are not available for the other genera.

Field notes taken by Dr. R. W. Poole, Systematic Entomology Lab-

oratory, USDA, describe the egg of *H. dissociaria* as being rounded at its base and flattened on top with a smooth texture and metallic tan coloring. Eclosion occurs after 9–15 days. The first instar larva is black and white banded, with a brown head and a slightly flattened body. The larva has four instars and feeds for about one month.

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