



FIG. 2. Pupae of *Occidryas anicia bernadetta*.

School of Life Sciences, University of Nebraska, Lincoln, NE 68588 (*S. occidentalis*); V. K. Gupta, Center for Parasitic Hymenoptera, Gainesville, FL 32602 (*Benjaminia* sp., *Pterocormus* sp.); S. R. Shaw and P. M. Marsh, Systematic Entomology Laboratory, USDA-ARS, Insect Identification and Beneficial Insect Introduction Institute, Beltsville, MD 20705 (*C. koebelei*).

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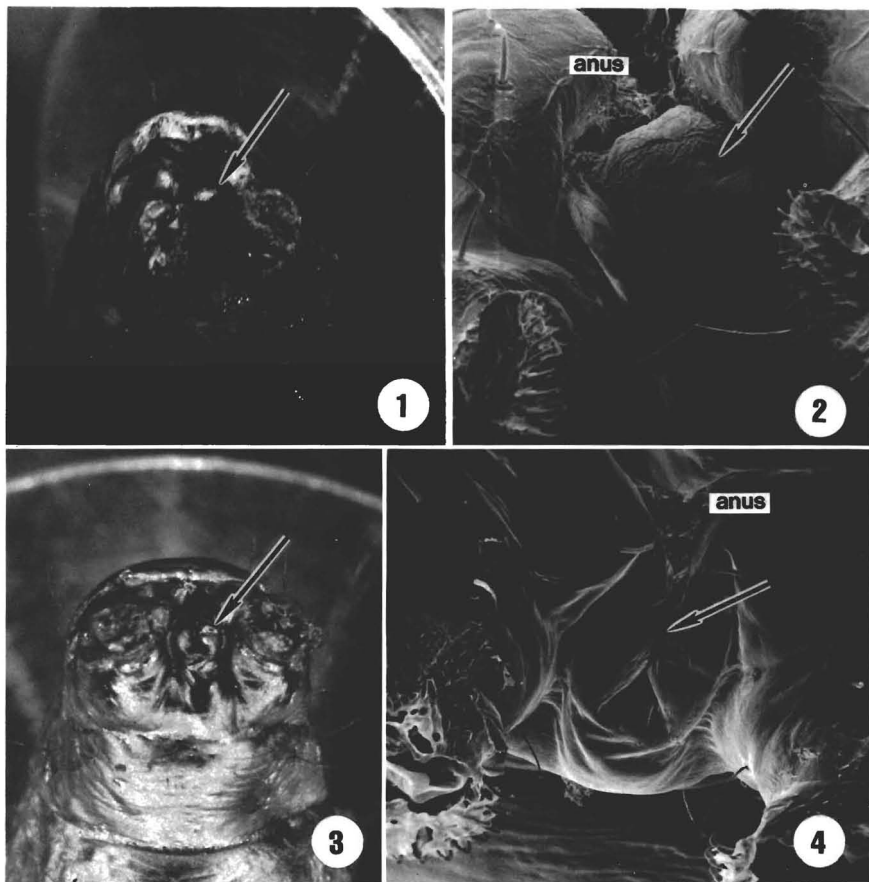
Journal of the Lepidopterists' Society
39(1), 1985, 57-59

NOTE ON CRUMB'S "LIBERAE ET CONFLUENTAE" COUPLET (NOCTUIDAE)^{1,2}

The first major systematic treatment of the larvae of North American Noctuidae was written by Crumb (1956, *Larvae of the Phalaenidae*, USDA Tech. Bull. 1135. 356 pp.). It is a monumental work, containing extensive diagnostic keys, larval descriptions, geo-

¹ Partially funded by the Illinois Agricultural Experiment Station Project 12-361 Biosystematics of Insects.

² Michigan Agricultural Experiment Station Journal Article No. 11102.



FIGS. 1-4. Tenth abdominal segments showing ventral and subanal regions of last instar noctuid larvae. 1 & 2, truncate or convex condition of posterior margin of venter (subanal region) (see arrows) (*Alypia octomaculata*); 3 & 4, medially impressed or grooved condition of the same region (see arrows) (*Papaipema nebris*). (Figs. 1 & 3 were photographed through a Leitz Aristophot, printed sizes = 9× and 13×, respectively; 2 & 4 were taken with the aid of a scanning electron microscope, printed sizes = 36×; all photographs by G.L.G.)

graphic distributions, and a wealth of host plant information. Experienced entomologists as well as students taking courses on immature insects have used it with varying degrees of satisfaction, but many have had interpretive difficulties with the keys.

The most obvious problems, according to a number of workers, are encountered in the first couplet of Crumb's "Key to subfamilies" (p. 2) and his figures "A" and "B" in Plate 1. At this point users of the key encounter Crumb's first major division of the noctuid larvae. He summarized the choices as "liberae" and "confluenteae" in reference to the spatial separation between the subanal and ventral areas on the 10th abdominal segment. The difficulty lies, not so much in the terminology, but in the user's trying to determine the perspective of the figures, which is obliquely posterior with the ventral

side up, and in relating the lengthy couplet to the line drawings. But even when one knows the perspective, it is difficult to position a caterpillar in the same view under a dissecting microscope and still keep it submerged in alcohol.

The purpose of our paper is to clarify this couplet by rewording it and offering light and SEM photographs of the appropriate structures. Hopefully, the overall utility of Crumb's publication will be enhanced. In all due respect, it should be noted that Crumb's publication was completed during a period of the author's failing eyesight in his retirement years (Clarke, pers. comm.). Otherwise, we are quite certain that it would have been more clearly illustrated and keyed.

Thus, our suggested alternative for the first couplet is:

1. Venter of abdominal segment 10 not grooved posteriorly, the posterior margin (subanal region) truncate or convex (Figs. 1, 2) 2
- Venter of abdominal segment 10 grooved posteriorly, the posterior margin (subanal region) medially impressed (Figs. 3, 4) 9

These differences show reasonably well in the accompanying illustrations of *Alypia octomaculata* Fabricius (eight-spotted forester) and *Papaipema nebris* (Guenée) (common stalk borer). However, proceed with caution, because as Crumb noted, the actual condition is sometimes very difficult to interpret if the specimen has been inflated or has had its rectum everted.

ACKNOWLEDGMENTS

This project was aided by the advice of J. R. Byers, Entomology Research Institute, Agriculture Canada, Ottawa, Ontario, Canada, and H. R. Sandberg, formerly with the Center for Electron Microscopy, University of Illinois, Urbana-Champaign. J. F. G. Clarke, U.S. National Museum of Natural History, Washington, DC, is thanked for his information about Crumb's career.

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Journal of the Lepidopterists' Society
39(1), 1985, 59-62

EGG PARASITISM OF *APANTESIS PARTHENICE* (ARCTIIDAE) THROUGH APPARENT PHORESY BY THE WASP *TELENOMUS* SP. (SCELIONIDAE)

On 8 Aug. 1982 while hiking along the north fork of Rock Creek near Saddlestring (Johnson Co.), Wyoming at the HF Bar Ranch (elev. 5400 ft) at 1400 h, I collected a nearly fresh female specimen of an arctiid moth, *Apantesis parthenice* Kirby. The insect was resting on sagebrush a few inches above the ground and was hand-caught. I pinched its thorax lightly and placed it in a folded glassine envelope (size 3.5 × 2 in) which then was quickly transferred into my enclosed leather collecting pouch. Upon returning to the ranch after several hours of hiking, all of the envelopes containing specimens taken that afternoon were dated and put into a plastic bag with a card containing collection data. This bag in turn was tightly folded, sealed with masking tape, and placed in a closed cigar box in a dresser drawer in my cabin at the ranch.

Upon returning to Maryland later in the month, the cigar box was opened and unpacked in my laboratory at U.M.B.C. on 27 Aug. At this time I discovered 71 small dark