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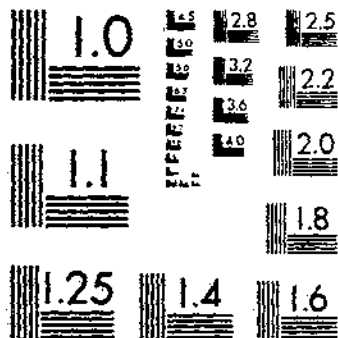
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THE LARVAE OF THE PHALAEINIDAE

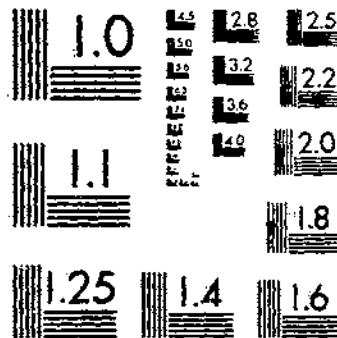
GRUMB, S. E.

1 OF 4

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MICROCOPY RESOLUTION TEST CHART  
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# THE LARVAE OF THE PHALAEINIDAE<sup>1</sup>

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## INTRODUCTION

The Phalaenidae, formerly known as the Noctuidae, is the largest family of the Lepidoptera, and includes a great many of our most important plant pests. They include the many kinds of cutworms and armyworms, and the tobacco budworm. One of the most destructive species, commonly known as the corn earworm, causes heavy losses not only on corn but also on cotton and tomatoes, as well as being a general feeder on many other crops. Because the larvae are responsible for the damage caused by members of this group, they are the forms most frequently observed and associated with economic injury. Therefore, correct evaluation of the importance of the various species is dependent upon correct identification of the larvae. This bulletin represents the first attempt to classify the larvae of this family.

## METHOD OF STUDY

The descriptions in this bulletin were prepared with the aid of a stereoscopic microscope and a lamp capable of producing a brilliant spot of light. Gross features, such as the width of the head and the distance between setigerous tubercles, were examined under low power (approximately  $21.25\times$ ). Medium power (approximately  $42.5\times$ ) was used for measuring the height of spiracles, and high power (approximately  $85\times$ ) for examination of the spinnerets and the labial palpi.

A simple holder that permitted examination of specimens, other than inflated ones, in any position was made from two tin salve boxes, one 50 mm., and the other 40 mm. in diameter. The smaller box was filled with sand or other material to add weight, and was provided with a lid. It was set at one side in the larger box and, after the specimen had been placed in the crevice between the boxes, was pushed against the specimen with sufficient force to hold it in the desired position. For examination in the horizontal position the specimen was placed on top of the smaller box with an elongate wire paper clip as a cradle.

The length of the spinneret was measured from the base of the basal shield. In occasional species, in which the basal shield covered more than the basal half of the spinneret, the width was taken at the point at which the spinneret became visible. Since the spinneret is often translucent and contains the silk duct, impressions as to its structure may be misleading unless it is examined by light reflected from the dorsal surface. Under this light and with the tip directed toward the source of light and usually below horizontal, the holder may be turned from side to side or the light shifted in position until the structure of the "dorsal" surface of the spinneret becomes evident. It is

<sup>1</sup> Submitted for publication May 13, 1955.

<sup>2</sup> The author was an entomologist with the former Bureau of Entomology and Plant Quarantine, and has completed these studies since his retirement.

essential that the spinneret and also the skin be free of surface moisture, and the same is true of other parts when very small measurements are being made.

It was sometimes advantageous to locate setigerous tubercle VII<sup>c</sup> on abdominal segment 2, where it is always present, and then seek it in a similar position on abdominal segment 1. This was done by locating VI and VIII and connecting them by an imaginary line. The intervening tubercle nearest this line was VII<sup>b</sup>, and VII<sup>c</sup> was found in the longitudinal area between VII<sup>b</sup> and VIII.

The descriptions in this bulletin are believed to be of mature larvae, and are drawn from live specimens unless otherwise indicated. The rim of the spiracle is always black in the absence of a statement to the contrary.

### ACKNOWLEDGMENTS AND SOURCES OF MATERIAL

Since the beginning of this investigation many persons have contributed specimens, made identifications, or have assisted in other ways, but the following have been particularly helpful: Wm. W. Baker, Foster H. Benjamin, Henry Bird, A. E. Brower, A. W. A. Brown, Hahn W. Capps, J. F. Gates Clarke, Harrison G. Dyar, Geo. P. Engelhardt, W. T. M. Forbes, J. G. Franclemont, C. W. Getzender, J. U. Gilmore, Carl Heinrich, James H. McDunnough, K. B. McKinney, Joe Milam, Charles Rummel, William Schaus, Joseph Wilcox, and A. K. Wyatt.

The distribution records were obtained primarily from collections in the U. S. National Museum, but the museum records have been supplemented by those in the following State, Province, and local lists, and occasionally by data obtained by the writer. The writings of John B. Smith, one of the outstanding American pioneers in the classification of the Phalaenidae, have also been consulted freely.

Bowman, Kenneth. Annotated Check List of the Macrolepidoptera of Alberta. Alberta Nat. Hist. Soc. 16 pp. Red Deer, Alberta. [1919.]

Blackmore, E. H. Check List of the Macrolepidoptera of British Columbia (Butterflies and Moths). Provincial Mus. Nat. Hist. 47 pp. Victoria, B. C. 1927.

Brimley, C. S. Family Noctuidae. In *his* The Insects of North Carolina, pp. 269-284. 1938.

Cook, William C. An Ecologically Annotated List of the Phalaenidae of Montana (Lepidoptera). Canad. Ent. 62: 257-264, illus., and 265-227 (1930); 63: 1-9, 25-30 (1931). (4 pts: Nov., Dec., Jan., Feb.). 1930-1931.

Grossbeck, John A. Insects of Florida. IV. Lepidoptera. Amer. Mus. Nat. Hist. Bul. 37: 1-147. 1917.

Knowlton, George F. Utah Insects. [II] Lepidoptera. Utah Agr. Expt. Sta. Mimeograph Ser., No. 200, pt. 2, 14 pp. 1939.

Knutson, Herbert. Minnesota Phalaenidae (Noctuidae). Minn. Agr. Expt. Sta. Tech. Bul. 165, 128 pp., illus. 1944.

Leonard, Mortimer Demarest, Editor. A List of the Insects of New York. N. Y. (Cornell) Agr. Expt. Sta. Mem. 101, 1121 pp. 1928.

Phipps, C. R. Blueberry and Huckleberry Insects. Maine Agr. Expt. Sta. Bul. 356, pp. [107]-232, illus. 1930.

Procter, William. Biological Survey of the Mount Desert Region (of Maine). Pt. VI, The Insect Fauna. Wistar Inst. Anat. and Biol. 496 pp. Philadelphia. 1938.

Richards, A. Glenn, Jr. Noctuidae of Northern Georgia and Tennessee (Lepidoptera). Ent. News 42: 247-252, 271-276. 1931.

Tietz, Harrison M. The Noctuidae of Pennsylvania. Pa. Agr. Expt. Sta. Bul. 335, 164 pp. 1936.

Walkden, H. H. Owllet Moths (Phalaenidae) Taken at Light Traps in Kansas and Nebraska. U. S. Dept. Agr. Cir. 643. 26 pp., illus. 1942.

All the illustrations either are original or have been taken from various publications of the writer, those for the Herminiinae almost entirely from "A Classification of Some Noctuid Larvae of the Subfamily Hypeninae" (Ent. Amer. 16 (n. s.), No. 4, 1934).

The nomenclature followed in this bulletin is that of J. McDunnough's "Check List of the Lepidoptera of Canada and the United States of America. Part I, Macrolepidoptera," which was issued in 1938 as a Memoir of the Southern California Academy of Sciences. There are a few deviations from this list to include information from more recent authoritative revisions. If the type designations of Samonelle (Entomologists' Useful Compendium, 1819) are accepted, the following changes in generic names become necessary:

*Amathes* Hbn. replaces *Graphiphora* Ochs (senses McDunnough)

*Graphiphora* Ochs replaces *Pseudospaerlotis* McD.

*Apamea* Ochs replaces *Septis* Hbn.

*Amphipoea* Billb. replaces *Apamea* Ochs (senses McDunnough)

### KEY TO THE SUBFAMILIES

Before attempting to use the keys the reader is urged to familiarize himself with the discussion in the preceding pages. Classification of previously determined larvae in several subfamilies would be particularly helpful before unknown species are determined.

The first couplet of the following key introduces a departure from the existing classification of the Phalaenidae in that two parallel series of subfamilies are established. The same two types of larvae are also found in the Geometridae and Arctiidae, and the occurrence of this parallelism within each of these three families presents a very puzzling problem.

It may be noted that the subfamilies in which the silk pore of the spinneret is concealed coincide with the Quadrifinae if the Plusiinae are excluded.

No larvae have been available in the Rivulinae, and no satisfactory place has been found for several species which are discussed in the Appendix. These unplaced species include *Baileya doubledayi*, *Noropsis hieroglyphica*, *Thurberiphaga diffusa*, and *Magusa orbifera*.

Data relative to variation and taxonomy are assembled under the appropriate couplet numbers immediately following the key.

1. Posterior extremity of venter of abdominal segment 10 cut off from the subanal area by a V-shaped, impressed, suture-like line, the apex at ventral end of the subanal slit and the arms embracing the entire width of the segment, which is protuberant posteriorly or bears a bluntly subconical projection (pl. 1, C, D)----- Larvae liberae \* 2
- Posterior extremity of venter of abdominal segment 10 with a triangular or elongate median area, impressed or margined by impressed lines and not occupying the full width of the segment which is obviously confluent with the subanal area between the median area and the base of the proleg (pl. 1, A, B)----- Larvae confluentae \* 9
2. Setigerous tubercle VII\* absent on abdominal segment 1 (pl. 4, C). Spinneret with an open apical or subapical silk pore (pl. 2, R, S) except in Acontiinae and Euteliinae (pl. 3, J)----- 3
- Setigerous tubercle VII\* present on abdominal segment 1 (pl. 4, D). Silk pore of spinneret concealed (pl. 3, I-R)----- 8

\* This character is usually not determinable with certainty in blown specimens or in those in which the rectum is everted.

3. Two setigerous tubercles of the VII group normally present on abdominal segment 7 (pl. 4, *F*). Spinneret short and broad, the length equal, at most, to but one and one-half times the median width; the large silk pore occupying nearly the entire width of the broad apex (pl. 3, *H*). Prolegs present on abdominal segments 3 and 4.----- Agaristinae  
But one setigerous tubercle of the VII group present on abdominal segment 7. Spinneret comparatively slender, the length equal to at least twice the median width except in some Acontinae in which prolegs are absent on abdominal segments 3 and 4.----- 4
4. Secondary hairs present on prolegs except in *Acronycta funeralis*. Setigerous tubercle VI on the abdomen bearing more than one seta on each abdominal segment except in *Raphia*.----- Acronyctinae  
Secondary hairs absent on the prolegs; these bearing but the usual three anterolateral setae of the VII group and one ventral seta (VIII). Setigerous tubercle VI on the abdomen bearing but one seta on each segment.----- 5
5. Spinules present on hind coxae except in *Schinia obscurata*. Spinneret at least twice as long as the labial palpus except in *Schinia brevis*.  
Heliothinae  
Spinules absent on hind coxae. Spinneret seldom twice as long as the labial palpus.----- 6
6. Prolegs absent on abdominal segments 3 and 4. Spinneret obsolescent, appressed to the labium and projecting but slightly. Subanal setae and median posterior setae on anal shield modified as an anal fork. Setigerous tubercle VII<sup>a</sup>, at most, but very slightly anterior to the transverse line of VII<sup>b</sup> on abdominal segment 1.----- Acontinae  
Prolegs present on abdominal segments 3 and 4. Spinneret free and projecting decidedly. Anal fork absent. Setigerous tubercle VII<sup>a</sup> well anterior to the transverse line of VII<sup>b</sup> on abdominal segment 1 (pl. 4, *O*).----- 7
7. Spinneret with an open apical or dorso-apical silk pore (pl. 2, *S*). Mandible without a basal tooth or process (pl. 5, *I-N*) or crochets biordinal (pl. 6, *H*) except in *Feralia* and genus No. 4.----- Cucullinae (as here restricted)  
Spinneret depressed medially near the apex and with lateral lobes, the silk pore concealed at base of this structure (pl. 3, *J*). Mandible with a large basal process bearing an apical molar area. Crochets on prolegs unordinal (pl. 6, *G*).----- Eutellinae
8. Two setigerous tubercles of the VII group present on abdominal segment 7 (pl. 4, *A*). Crochets on prolegs bearing a large subapical tooth (pl. 6, *F*).----- Bagisarinae  
But the usual one tubercle of the VII group present on abdominal segment 7 (pl. 4, *B*). Crochets without a subapical tooth.----- Hypeninae
9. Silk pore of spinneret open, apical or dorso-apical, usually distinct except in Phalaeninae and Hadeninae in which the opening is a transverse or U-shaped slit, seldom visible (pl. 2, *A-O*). Five pairs of prolegs present and setigerous tubercle VII<sup>a</sup> absent on abdominal segment 1 (pl. 4, *G*) except (both characters) in some Plusiinae.----- 10  
Silk pore concealed in a median depression near apex of spinneret, the depressed area margined by lateral lobes (pl. 3, *I-R*) except that an open apical silk pore is present in *Hypsoropha* in the Catocalinae. With prolegs absent on abdominal segments 3 and sometimes on 4 or with setigerous tubercle VII<sup>a</sup> present on abdominal segment 1 (pl. 4, *H*). Exceptions are *Neorastris* and *Chamyris* in the Lithacodilinae and the Sarrothripinae.----- 13
10. Spinneret without a visible opening to the silk duct owing to partial or complete collapse of the dorsal wall of the spinneret, the product of the silk gland being extruded through a transverse or U-shaped apical slit (pl. 2, *A-O*).----- Phalaeninae, Hadeninae<sup>4</sup>  
Spinneret often flattened dorsally or with a dorsal groove but with a distinct apical or dorso-apical silk pore which is seldom narrowly transverse (pls. 2, *P-S*, and 3 *A-H*).----- 11
11. Setigerous tubercle V present on abdominal segment 9 (pl. 6, *D*). Each anterior proleg with 50 or more crochets in the mature larva.----- Ufeinae  
Setigerous tubercle V absent on abdominal segment 9 (pl. 6, *C*). Each anterior proleg with 35 crochets or less in the mature larva.----- 12

<sup>4</sup>For separation of these two subfamilies, see discussion under this couplet number following the key.

12. Crochets on prolegs uniorbital (pl. 6, G) except in *Platyperigea* and *Andropolla*. Five pairs of prolegs present.-----Amphipyriinae  
 Crochets biordinal (pl. 6, H). But three pairs of prolegs present except in  
*Abrostola* and *Mouralia*.-----Plusiinae
13. Setigerous tubercle VII<sup>c</sup> absent on abdominal segment 1 (five tubercles present ventrad of IV) (pl. 4, G) (see discussion under couplet 9)-----14  
 Setigerous tubercle VII<sup>c</sup> present on abdominal segment 1 (six tubercles present ventrad of IV) (pl. 4, H).-----15
14. Seta O<sup>1</sup> on head, at most, but equidistant between ocelli III and IV; otherwise nearer to IV. Setae usually short but long in *Eublemma* and *Chamyris*.-----Lithacodiinae  
 Seta O<sup>1</sup> approximately three times as near to ocellus III as to IV (3:8).  
 Setae long, weak, slender, some dorsal setae as long as a body segment or more.-----Sarrothripinae
15. Setigerous tubercle II<sup>c</sup> of the prothorax ventrad of the margin of the cervical shield (pl. 7, L). Moderately large to large larvae feeding on green plants.-----Catocalinae  
 Setigerous tubercle II<sup>c</sup> on the cervical shield (pl. 7, Q). Usually small to very small larvae feeding on dead plant material or fungi, with some exceptions.-----Herminiinae

## Couplet 1

In nearly all cases the condition of the 10th abdominal segment, whether the venter is free posteriorly or confluent with the subanal area, is obvious and uniform in each of the subfamilies, but in that section in which the venter of abdominal segment 10 is normally free posteriorly the venter is clearly confluent with the subanal area in *Eutolyte* and *Psaphida* in the Cuculliinae while in that section of the family in which the 10th abdominal segment is normally confluent with the subanal area, the venter of this segment is clearly free in *Ogdoconta* and *Xanthoecia* in the Amphipyriinae. In addition, the genus *Characoma* in the Sarrothripinae appears to have the venter of abdominal segment 10 free posteriorly, although it probably is not, while this segment is confluent in *Sarrothripus*.

The above five genera may be separated from the remainder of the Phalaenidae as follows:

*Eutolyte* and *Psaphida* would fall into group 7 of the Amphipyriinae under *Amphipyra* with which agreement is very close, although *Amphipyra glabella* is the only species with which *Eutolyte* and *Psaphida* might be confused.

In *Ogdoconta* the normally projecting portion of the spinneret is completely absent; setigerous tubercle VII<sup>c</sup> is present on abdominal segment 1, and the full normal number of prolegs is present.

In *Xanthoecia* the mandible has but one seta and setigerous tubercle II<sup>c</sup> is on the cervical shield. Bores in lizard tail (*Saururus*).

In *Characoma* the frontal setae are at lateral margin of front; seta O<sup>1</sup> on the head is approximately three times as near to ocellus III as to IV, and the setae are weak, slender, and as long as a body segment or more.

## Couplet 9

In larvae in which the 10th abdominal segment is confluent with the subanal area, setigerous tubercle VII<sup>c</sup> is always present on abdominal segment 1 in the Catocalinae and Herminiinae, and occurs adventitiously in *Ogdoconta*, *Leuconycta*, and *Platysenta* in the Amphipyriinae; in four genera of the Plusiinae and in *Eublemma* and *Erastria* in the Erastriinae.

The above nine genera may be separated from the remainder of the Phalaenidae by the characters indicated below:

*Ogdoconta*, *Platysenta*, and *Leuconycta*.—Projecting portion of spinneret completely absent. Five pairs of prolegs present. Crochets uniordinal.

*Genera of the Plusiinae*.—Prolegs absent on abdominal segments 3 and 4. Crochets on prolegs biordinal. Setigerous tubercles VII<sup>a</sup> and VII<sup>c</sup> fused on abdominal segments 1 to 4.

*Eublemma*.—Small, fusiform larvae (12 mm.) with very long, weak, dorsal setae and prolegs absent on abdominal segments 3 and 4. Setigerous tubercle IV<sup>c</sup> on abdominal segment 8 displaced ventrad as on 7. Setigerous tubercle VII<sup>c</sup> directly ventrad of VII<sup>b</sup> on abdominal segment 1.

*Erastria*.—Prolegs absent on abdominal segment 3 and greatly reduced on 4. Two of the tarsal setae decidedly broadened basally with acute tips. Feed on herbs.

Among the larvae included under the first section of couplet 9 owing to the presence of an open, apical silk pore, *Callopietria* is the only known exception, the opening apparently being concealed near the apex of the spinneret as in the Quadrifinae in this genus. *Callopietria* may be distinguished from related larvae owing to the presence of about 12 small teeth on the cutting margin of the mandible.

#### Couplet 10

Larvae of the Hadeninae usually differ in habitus from those of the Phalaeninae but no characters are known through which a clear-cut separation of the two subfamilies might be effected. Perhaps 90 percent of the species may be correctly placed on a spinneret character as indicated below.

Spinneret usually broader than long and, at most, with the length equal to less than twice the median width.....Phalaeninae  
(Exceptions: *Ochropleura*, *Diarsia*, *Pseudospaciotis*, *Anaplectoides*, Genus No. 6, and *Hemigraphiphora*.)

Length of spinneret equal to twice the median width or more.....Hadeninae  
(Exceptions: *Xanthopastis*, *Scotogramma*, *Miodera*, *Lasionycta* in part, *Orthodes*, *Leucania* in part, *Nephelodes*, *Stretchia*, *Xylomania* in part, *Orthosia* in part, and *Xylomyges*.)

The complete separation of the genera belonging to the two subfamilies seems to require the rather cumbersome procedure set forth in the following two keys, in the first of which the respective genera are grouped while in the second the respective groups are isolated:

1. Length of spinneret equal to twice the median width or more..... 5
- Length of spinneret equal to less than twice the median width..... 2
2. Mandible with a basal tooth or process on oral face..... 4
- Mandible without a basal tooth or process on oral face..... 3
3. Phalaeninae Group 1: *Copablepharon*, *Agratis*, *Lozagrotis*, *Hemicuonca*, *Anicla*, *Spaciotis*, *Actebia*, *Pseudorthosia*, *Peridroma*, *Cerastis*, *Chacphora*, and *Anomogyne* in part.
- Hadeninae Group 1: *Xanthopastis*, *Scotogramma*, *Miodera*, *Orthodes*, *Leucania* in part, *Nephelodes*, and *Lasionycta* in part.
4. Phalaeninae Group 2: *Anomogyne* in part, Genus No. 5, *Setagrotis*, *Heptagrotis*, *Eurois*, *Graphiphora*, *Pronoctua*, *Adelphagrotis*, *Abagrotis*, *Protolampra*, *Rhynchagrotis*.
- Hadeninae Group 2: *Stretchia*, *Xylomania* in part, *Orthosia* in part, and *Xylomyges*.
5. Mandible with a basal tooth or process on oral face..... 7
- Mandible without a basal tooth or process on oral face..... 6

6. Phalaeninae Group 3: Genus No. 6 ("*Protolampra*" *brunneicollis*)  
 Hadeninae Group 3: *Protorthodes*, *Lachipolia*, *Lasionycta* in part, genus No. 7, genus No. 8, *Lasiestra*, *Zosteropoda*, *Anarta*, *Pseudorthodes*, *Tricholita*, *Lophoceramica*, genus No. 9, *Homorthodes*, *Protoleucania*, *Dargidc*, and *Leucania* in part.
7. Phalaeninae Group 4: *Ochropleura*, *Diarsia*, *Pseudospaelotis*, *Anaplectoides*, and *Hemigrapphophora*.  
 Hadeninae Group 4: Genus No. 10, *Miscitia*, *Hadona*, *Polia*, *Ceramica*, *Morrisonia*, *Xylomania*, *Mamestra*, *Crocigrapha*, *Orthosia* in part, and *Acerra*.  
 Group No. 1: With none of the characters indicated below----- Phalaenidae  
 Setigerous tubercle VI bearing two setae on all thoracic segments (*Xanthopastis*), emargination in anterior margin of labrum very broad (pl. 10, F), (*Scotogramma*), third segment of labial palpus much longer than the basal segment (*Miodera*), labial palpus twice as long as the spinneret exclusive of the apical spinules (*Orthodes*), lingua of hypopharynx bearing long hairs anteriorly (*Leucania* in part), seta II<sup>c</sup> absent on prothorax (*Nepheodes*), and skin minutely pubescent, the setae above anterior emargination in labrum stout, spur-like (*Lasionycta* in part)----- Hadeninae
- Group No. 2:  
 Third segment of labial palpus, at most, but slightly longer than the second segment (4:3) or, if third segment longer, with a thin basal tooth on oral face of mandible (pl. 5, H)----- Phalaeninae  
 Third segment of labial palpus twice as long as the second segment or more, and mandible with a basal process bearing on apical molar area (pl. 5, E) except in *Stretchia*----- Hadeninae
- Group No. 3:  
 Including genus No. 6 only ("*Protolampra*" *brunneicollis*)----- Phalaeninae  
 Including all of the remaining genera----- Hadeninae
- Group No. 4: With none of the characters indicated below----- Phalaeninae  
 With at least one of the following characters: Mandible with a basal process on oral face bearing an apical molar area, lateral or ventral setigerous tubercles at least moderately large or spinneret tapering strongly toward the tip----- Hadeninae

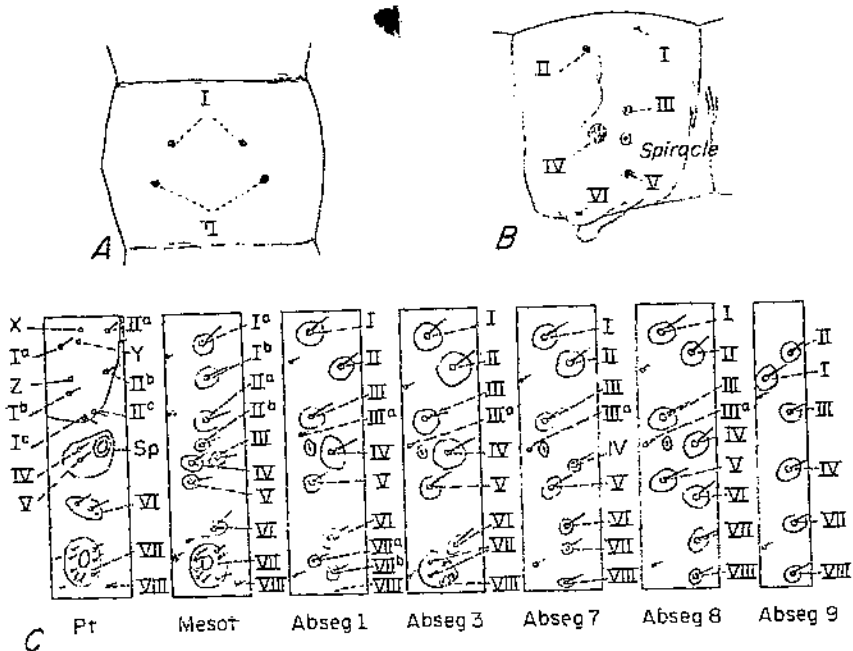
A few genera of the Hadeninae, all belonging to that section lacking a basal tooth or process on the mandible, deviate from the condition usually prevailing in the Phalaeninae and Hadeninae in that the spinneret bears a definite apical silk pore. These genera run to groups 6 and 7 in the Amphipyridinae where they are segregated and referred to the Hadeninae. The genera include:

*Lasiestra* and Genus No. 8, arctic or subarctic genera, in which the labial palpus is but approximately one-half as long as the spinneret and the occipital angle is decidedly acute, and Genus No. 7, *Lasionycta* in part (*perplexa*), *Tricholita*, *Lophoceramica*, *Anarta*, *Homorthodes* in part, and Genus No. 9 ("*Protorthodes*" *texana*) in which the labial palpus and spinneret are subequal in length and the head is freckled with black or brown except in Genus No. 7 ("*Polia*" *detracta*).

#### Couplet 14

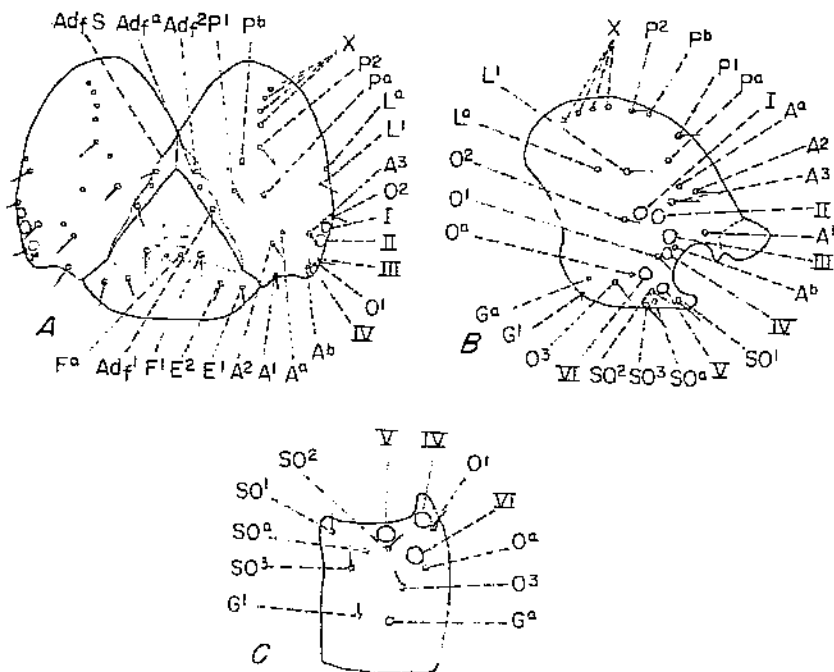
A few aberrant genera in which setigerous tubercle II<sup>c</sup> is not on the cervical shield, are placed in the Herminiinae. The characters in which these genera differ from the Catocalinae are indicated below:

*Phyprosopus* with dense secondary hairs on head and body;  
*Litoprosopis* with three or four setae on setigerous tubercle VI on prothorax and with two setae each on remaining thoracic segments; and *Metalectra* in which prolegs are absent on abdominal segments 3 and 4 and the dorsal setigerous tubercles are large and distinctly elevated, including those on the cervical shield.



TEXT FIGURE 1.

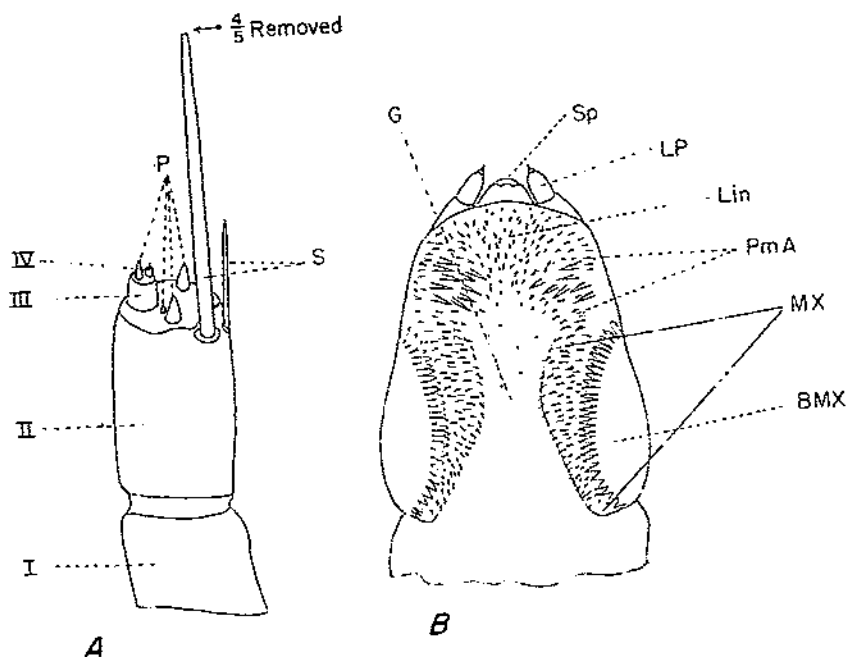
- A. An abdominal segment of a larva, dorsal view, showing setigerous tubercles I (anterior) and II.
- B. An abdominal segment of a larva, lateral view, giving the notation of the setigerous tubercles, IV posterior to the spiracle.
- C. *Agrotis (Feltia) ducens*: Setal map of larva, showing arrangement of setae and punctures on body: Pt, prothorax; Mesot, mesothorax; Abseg 1, first abdominal segment; Abseg 3, third abdominal segment; Abseg 7, seventh abdominal segment; Abseg 8, eighth abdominal segment; Abseg 9, ninth abdominal segment; Sp, spiracle.



TEXT FIGURE 2.

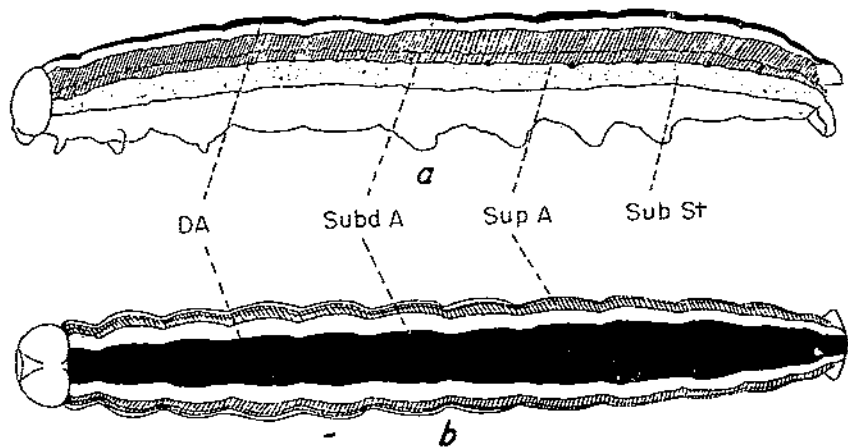
- A. *Agrotis (Feltia) subterranea*: Head shield of larva, dorsal view, showing arrangement of setae and punctures.
- B. *Agrotis (Feltia) subterranea*: Head shield of larva, lateral view, showing arrangement of setae and punctures.
- C. *Agrotis (Feltia) subterranea*: Head shield of larva, ventral view, left half, showing arrangement of setae and punctures.

Explanation of symbols used: A<sup>1</sup>, A<sup>2</sup>, A<sup>3</sup>, A<sup>a</sup>, anterior setae and puncture of head shield; Adf<sup>1</sup>, Adf<sup>2</sup>, Adf<sup>a</sup>, adfrontal setae and puncture of head shield; Adf<sup>S</sup>, adfrontal suture; E<sup>1</sup>, E<sup>2</sup>, epistomal setae; F<sup>1</sup>, F<sup>a</sup>, frontal seta and puncture; G<sup>1</sup>, G<sup>a</sup>, genal seta and puncture of head shield; L<sup>1</sup>, L<sup>a</sup>, lateral seta and puncture of head shield; O<sup>1</sup>, O<sup>2</sup>, O<sup>3</sup>, O<sup>a</sup>, O<sup>b</sup>, ocellar setae and punctures of head shield; P<sup>1</sup>, P<sup>2</sup>, P<sup>a</sup>, P<sup>b</sup>, posterior setae and punctures of head shield; SO<sup>1</sup>, SO<sup>2</sup>, SO<sup>3</sup>, SO<sup>a</sup>, subocellar setae and puncture of head shield; X, ultraposterior setae and punctures of head shield; I, II, III, IV, V, and VI, ocelli.



TEXT FIGURE 3.

- A. Antenna of larva: I, II, III, IV, segments of antenna; P, papillae; S, antennal setae.  
 B. *Agrotis ypsilon*: Hypopharynx of larva, including the spinneret (Sp) and labial palpi (Lp); G, gorge; Lin, lingua; PmA, premaxillary area; MX, lobes of the maxillulae; BMX, blade of the maxillulae.



TEXT FIGURE 4.

- A. Colorational areas of larva: a, lateral view; b, dorsal view; DA, dorsal area; SubdA, subdorsal area; SupA, supraspiracular area; SubSt, subventral stripe.

## Subfamily AGARISTINAE

1. Mandible without a basal tooth or process on oral face (pl. 5, *I-N*). Length of epipharynx equal to length of labrum..... 2  
 Mandible normally with a basal tooth or process on oral face (pl. 5, *A-E*). Length of epipharynx equal to approximately two-thirds length of labrum (13:19), or less. Hind coxae less than one-third the femur width apart (5:17), except in *Psychomorpha*..... 4
2. Setae I<sup>a</sup> and I<sup>b</sup> on prothorax, I<sup>b</sup> on mesothorax and metathorax, and II on abdominal segment 8 much larger than the other setae, black and flattened (spatulate). Hind coxae nearly or quite touching. Setigerous tubercle VII<sup>a</sup> absent on 8. With about five transverse black stripes per segment. *Xerociris*
- All setae unmodified. Hind coxae more than one-half the femur width apart. Seta VII<sup>a</sup> normally present on abdominal segment 8. With but one transverse black stripe per segment, obscure in *Misa*..... 3
3. Hind coxae less than femur width apart (15:23). Black markings on head restricted to spots at setal insertions..... *Copidryas*  
 Hind coxae width of femur apart. Head closely and rather uniformly freckled with black..... *Misa*
4. Setigerous tubercle VII<sup>a</sup> normally present on abdominal segment 8. Black markings on head not restricted to setal insertions except in *octomaculata*. Setae white. A conspicuous intersegmental white spot between setigerous tubercle IV on 7 and V on 8..... *Alypia*, *Androloma*  
 Setigerous tubercle VII<sup>a</sup> absent on 8. Black markings on head restricted to spots at setal insertions. Setae brown to blackish. No intersegmental white spot between IV on 7 and V on 8..... 5
5. Mandible with a small, thin, basal tooth on oral face. Hind coxae nearly width of femur apart (14:16)..... *Psychomorpha*  
 Mandible with a basal process on oral face, bearing a narrow, apical molar area. Hind coxae approximately one-sixth the femur width apart (3:20), or less..... *Euthisanotia*

## XEROCIRIS Ckll.

## XEROCIRIS WILSONI (Gr.)

Head 3.8 mm. broad. Body about 35 mm. long and 7 mm. broad at middle, abdominal segment 7 and 8 broadened and strongly humped dorsally; skin pavement-granulose; general color blackish.

Each segment with about five transverse, black stripes diffused midventrally, but otherwise encircling the segments, separated by narrow pale or orange lines. The median black stripe obliterated on the abdomen from the spiracle to the subventral area by an orange spot extending narrowly across the dorsum on abdominal segment 7 and broadly across 8. Spiracles black. Venter blackish. Some dorsal setigerous tubercles on thorax and II on 8 bearing large, spatulate black setae. Cervical shield tinged with orange, with black anterior and posterior margins. Anal shield probably orange with black anterior margin. Head orange with small black spots at some of the setal insertions; cutting margin of mandible with 4 large ventral teeth and about 7 denticles on dorsal margin.

Described from two mature larvae from the U. S. National Museum: 1 inflated larva without data and 1 alcoholic specimen: "H. W. C. *Cissus trifoliata*, Brownsville, Tex., 26 April 1939. Lot 39-6039, Associated with adult det. by J. F. G. C."

*Distribution*.—Arizona and Texas.

*Food plant*.—*Cissus trifoliata* (teste Capps).

## COPIDRYAS Grt.

## COPIDRYAS GLOVERI (G. &amp; R.)

Head 3 to 3.1 mm. broad. Body about 35 mm. long and 7 mm. broad at middle, broadening gradually posteriorly; skin smooth; general color dull whitish with a transverse black stripe on most segments.

A transverse black stripe on each segment but prothorax and 9, widely obliterated middorsally, extending somewhat ventrad of the spiracles and including all of the dorsal setigerous tubercles to, but not always including, V. Narrowing the middorsal apices of the broken black stripe and occupying the space between tubercles II is an orange spot appearing on abdominal segments 1 to 7 and in somewhat different form on other body segments. A narrow black line at anterior margin of abdominal segments dorsally and numerous small black spots dorsally near juncture of segments. Spiracles black. A longitudinal orange stripe between setigerous tubercles V and VI. Venter white flecked with black, the tubercles black. Cervical shield and anal shield orange, the setal insertions in small black spots. Head orange with small black spots at setal insertions; mandible bearing about 3 large teeth ventrally and about 6 subsidiary denticles dorsally on edge of cutting margin, the ventral margin of first ventral tooth provided with about 7 sharp denticles.

Described from 2 mature larvae from the U. S. National Museum: 1 inflated: "On purslane, 10.2.89" and 1 alcoholic: "H. W. C. (apps), Juarez, Chih., Mexico, 21 Aug., 1942, Lot 42-10579, El Paso, Tex., 35249."

*Distribution.*—Arizona, New Mexico, Texas, Colorado, Kansas, and Nebraska.

*Food plant.*—Purslane (*Portulaca oleracea*).

### MISA Karsch

#### MISA COSYRA (Druce)

Head 3.7 mm. broad. Body about 37 mm. long and 7 mm. broad at middle, abdominal segments of about equal width to 8, skin smooth; general color whitish.

Body whitish overlaid with black which tends to form a transverse band on each abdominal segment, including the dorsal setigerous tubercles. Broken middorsal and subdorsal white lines. A white line dorsal of setigerous tubercle V. Spiracles black. Setigerous tubercles black encircled with white. Anal shield white with black markings. Cervical shield white, the setal insertions in black spots. Head white, rather closely and uniformly freckled with black; mandible with 4 teeth and a broad straight dorsal margin on cutting edge.

Described from two larvae from the U. S. National Museum: 1 alcoholic larva: "Ex giant tarajillo, Hermosilla, Sonora, Mexico" and 1 alcoholic larva: "Phoenix, Ariz., on Opuntia, Sept. 1904, H. E. Kunze."

*Distribution.*—Arizona and Sonora (Mexico).

*Food plants.*—Opuntia and "giant tarajillo," presumably the saguaro (*Carnegiea gigantea*) (teste Heinrich).

### ALYPIA Hbn.

#### ANDROLOMA Grt.

1. With about 8 transverse black lines dorsally on each segment, the median pair margining an orange band. Black markings on head confined to black spots at setal insertions and a small spot posteriorly on occiput. Labrum not black. Setigerous tubercles on venter of abdominal segments 1 and 2 flat; VII<sup>b</sup> and VII<sup>c</sup> not fused on 2.----- *Alypia octomaculata*  
Transverse black markings absent or not as above on dorsum. Black spots at setal insertions on head interspersed with black freckles; a large black area posteriorly on occiput; median line, base of front, ventral surface, and most of the labrum black.----- 2
2. With a transverse black stripe including the setigerous tubercles on each segment and without orange markings except on cervical shield. Setigerous tubercles VII<sup>b</sup> and VII<sup>c</sup> completely fused on abdominal segment 2.----- *Alypia ridingsi*  
With obscure, transverse black lines, more evident laterally on each segment, or with none. Setigerous tubercles VIII<sup>b</sup> and VII<sup>c</sup> well separated on 2.----- 3

3. Orange markings restricted to dorsum of abdominal segment 8. The linear black markings tend to form broken longitudinal lines in the area between setigerous tubercles II and V. No transverse black lines near juncture of segments laterally.----- *Androloma maccullochi*  
 A transverse orange stripe on each segment. The linear black markings not forming longitudinal lines but tending to form irregular, transverse lines near juncture of segments laterally.----- *Alypia langtoni*

#### ALYPIA OCTOMACULATA (F.)

Head 3 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, abdominal segments of about equal width except that 7 and 8 are broadened, with a decided dorsal hump on 8; skin smooth; general color white with well-defined transverse black lines and an orange band on each segment.

With about eight well-defined transverse black lines on each segment, not extending ventrally much below the line of the spiracles, the median pair enclosing an orange stripe on each segment less well-defined dorsally on the thorax. Spiracles black. Subventral white stripe between the spiracles and setigerous tubercles V represented by irregular white spots near juncture of segments and forming a conspicuous intersegmental white spot posterior to IV on 7 and anterior to V on 8. A black stripe in the line of the prolegs. Venter otherwise largely white except black between the prolegs. Cervical and anal shields orange with the setae in black spots. Head color indeterminable, the black markings confined to spots at setal insertions, the median line and a small black area posteriorly on the occiput, labrum not black; mandible with a large basal process bearing a narrow apical molar area; cutting margin with 3 large teeth and a long, finely crenulate dorsal margin.

Described from two mature and one immature alcoholic larvae collected at Clarksville, Tenn., VII.30.1924 on *Ampelopsis*, and one mature inflated larva from the U. S. National Museum collected at Washington, D. C., VI.24.1918, by A. N. Caudell on grape.

*Distribution.*—Colorado, Kansas, Texas, Missouri, Illinois, Michigan, Tennessee, Mississippi, Florida, South Carolina, District of Columbia, Pennsylvania, New York, and Massachusetts.

*Food plants.*—Grape and Virginia Creeper (*Ampelopsis*).

#### ALYPIA RIDINGSI Grt.

Head 2.7 mm. broad. Body about 30 mm. long and 4 mm. broad at middle tapering somewhat posteriorly and without a dorsal hump on abdominal segment 8; skin smooth; general color white with a conspicuous transverse black stripe on each segment except prothorax.

Each segment except prothorax with a conspicuous transverse black stripe including the setigerous tubercles to VI and the spiracles; with traces of a transverse black line at both anterior and posterior margins and marked with yellow at about the level of the spiracles. Spiracles black. Setigerous tubercles large, black, strongly elevated and bearing very heavy white setae. Cervical shield white tinged with orange, spots at base of setae and lateral margin black. Anal shield largely black. Head white with irregular black spots at setal insertions interspersed among black freckles, ventral surface black.

Described from one mature alcoholic larva collected in April 1938 in the Lovejoy Buttes of the Mohave Desert in Los Angeles County, Calif., by Dr. John A. Comstock from whom the specimen was received. Comstock and Dammers (15<sup>6</sup>) give an illustrated account of this species in which it is stated that larvae are found in April and May and moths are on the wing from late March to early May of the following year.

<sup>6</sup> Italic numbers in parentheses refer to Literature Cited, p. 355.

*Distribution.*—California, Nevada, Utah, Arizona, and Colorado.

*Food plants.*—Comstock and Dammers (loc. cit.) record the following as food plants: *Oenothera bistorta*, *Eulobus californicus*, *Oenothera dentata*, and *Clarkia rhomboidea*.

#### ALYPIA LANGTONI Couper

Head 2.5 to 2.7 mm. broad. Body about 35 mm. long and 4.5 mm. broad at middle, slightly broadened on abdominal segments 7 and 8 and with a slight, rounded, dorsal hump on 8; skin smooth; general color white with linear, irregular black markings.

Middorsal line marked by a concentration of black spots, usually including two spots anterior to the line of tubercles I and two larger, more elongate spots posterior to the line of II, with a transverse black bar anterior to them. These spots may become more or less fused, then showing traces of a white middorsal line and sometimes forming black spots including I and II and extending to III. No transverse black dorsal lines through and anterior to I. No tendency toward the formation of longitudinal black lines between II and V. The black markings tend to form transverse black lines between III and V near juncture of segments. There is an inconspicuous orange band encircling each segment, and a yellowish area anterior to the spiracles. Spiracles black. Subventral pale stripe scarcely indicated except in a conspicuous intersegmental white spot on 7 and 8. Two more or less fused black lines in the line of the prolegs; venter otherwise largely white. Cervical and anal shields orange with setal insertions in black spots. Head white with black spots at setal insertions, interspersed with black freckles; occiput posteriorly, median line, adfrontal areas apically, base of front, most of labrum, a spot including the ocelli and ventral surface of head, black.

Described from numerous larvae collected from late in June to early in August in Washington by C. W. Getzendaner, Wm. W. Baker, and the writer. Moths emerged in June of the following year and were determined by Clarke.

*Distribution.*—United States: Washington, New York, New Hampshire, and Maine; also Alaska. Canada: Alberta, Manitoba, Ontario, and British Columbia.

*Food plants.*—Species of *Epilobium*.

#### ANDROLOMA MAC-CULLOCHI (Kirby)

Head 2.6 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of about equal width, with a slight dorsal hump on 8; skin smooth; general color white with a black middorsal stripe and fine black markings.

The broken white middorsal line bordered with black forming a middorsal stripe, except on abdominal segment 8, narrowed between setigerous tubercles I. An orange subdorsal spot on 8; no other orange markings on abdomen. Black linear markings tending to be longitudinal between II and IV. No transverse black lines near juncture of segments laterally. An irregular longitudinal black line between V and VI and another ventrad of VI. Spiracles black. An obscure white stripe including V, more or less invaded by the black markings and forming a distinct white intersegmental spot on 7 and 8. Venter mostly white. Head white with black freckles and the setae in black spots except that P<sup>1</sup> and P<sup>2</sup> are in a black stripe; adfrontal areas, median line, base of front, labrum except anterior margin and ventral surface, black; mandible bearing a large, thin basal tooth with crenulate apical margin and without a molar area, 4 large teeth and about 6 low denticles on cutting margin.

Described from one mature inflated larva from the U. S. National Museum labeled "1091 Dyar and Caudell." Larvae were collected near Manitou, Colo., July 21, and a moth emerged May 4 of the following year.

*Distribution.*—United States: Washington, Oregon, Idaho, Montana, Wyoming, Colorado, and California; also Alaska. Canada: Hudson Bay, British Columbia, and Alberta.

*Food plant.*—Fireweed (*Epilobium angustifolium*).

### PSYCHOMORPHA Harr.

#### PSYCHOMORPHA EPIMENIS (Drury)

The specimens described probably are immature. Head 2.3 mm. broad. Body about 20 mm. long and 3.5 mm. broad, abdominal segments of about equal width to 8, with a strong dorsal hump on 8; skin smooth; general color bluish white with transverse black stripes.

Bluish white with four transverse black stripes on each segment extending to well ventrad of the spiracles and tending to become irregular or absent on the venter. An orange spot on abdominal 8 extending across the dorsum from one spiracle to the other. Spiracles black. Cervical shield and anal shield orange, the setal insertions in black spots. Head apparently orange, the setal insertions in black spots; mandible with a small, thin tooth bearing several denticles apically and arising basally from the second rib, with three large teeth and a broad, crenulate, dorsal margin on cutting edge. The characteristic two members of the VII group of tubercles both present on abdominal segment 7 in but one of the four specimens examined.

Described from four specimens from the U. S. National Museum, all probably immature, labeled "Collection H. G. Dyar."

*Distribution.*—Texas, Oklahoma, Kansas, Missouri, Illinois, Iowa, Virginia, Pennsylvania, New Jersey, Massachusetts, and New York.

*Food plant.*—Grape.

### EUTHISANOTIA Hbn.

1. Of eastern distribution. Ground color of body bluish white..... 2  
Reported from California only. Ground color of body white. Second segment of antenna black. Setae  $P^1-P^1$  farther apart than setae  $P^2-P^2$  (52:44). Head of mature larva 2.65 mm. wide..... *brevipennis*
2. Setae  $P^1-P^1$  not farther apart than setae  $P^2-P^2$ . Second segment of antenna brown. Head of mature larvae 3.2 to 3.4 mm. wide..... *grata*  
Setae  $P^1-P^1$  farther apart than  $P^2-P^2$  (56:51). Second segment of antenna black. Head of mature larva 2.85 to 3.0 mm. wide..... *unio*

#### EUTHISANOTIA BREVIPENNIS (Stretch)

Head 2.65 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of about equal width throughout with a slight dorsal hump on 8; skin smooth; general color white with transverse black lines.

Ground color white with six transverse black lines on each segment, the median pair including an orange line, sometimes reduced through broadening of the bordering black lines. Spiracles black. Cervical shield and anal shield apparently orange with the setigerous tubercles in black spots. Head apparently orange, the setigerous tubercles in black spots.

Described from one larva in the U. S. National Museum labeled "Los Angeles Co., Calif., through C. V. Riley." Comstock and Dammers (13) give an account of this species with excellent figures.

*Distribution.*—Reported from California only.

*Food plant.*—Willow herb (*Epilobium californicum*), and larvae were reared on various species of evening-primrose. (Comstock and Dammers).

## EUTHISANOTIA GRATA (F.)

Head 3.2 to 3.4 mm. broad. Body about 40 mm. long and 5.5 mm. broad at middle, broadening posteriorly, particularly on abdominal segments 7 and 8, with a decided dorsal hump on 8; skin smooth; general color bluish white with transverse black lines and a transverse orange stripe on each segment.

With about 6 slender transverse black lines on each segment except less on thorax, the middle pair farther apart than the others and including an orange stripe. Spiracles black. Setigerous tubercles in black spots throughout. Cervical and anal shields orange. Head probably orange; mandible with a basal process, cutting edge bearing three large ventral teeth and the long dorsal margin finely crenulate.

Described from about 25 mature alcoholic larvae collected near Urbana, Ill., September 21, 1944, and reared on grape by A. K. Wyatt.

*Distribution.*—Texas, Kansas, Iowa, Minnesota, Illinois, Georgia, North Carolina, Maryland, New Jersey, Pennsylvania, and New York.

*Food plant.*—Grape.

## EUTHISANOTIA UNIO Hbn.

Head 2.85 to 3 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, broadening gradually posteriorly, especially on abdominal segments 7 and 8, with a decided dorsal hump on 8; skin smooth; general color bluish white with transverse black lines and a transverse orange stripe on each segment.

About six transverse black lines present on each segment, except less on thorax, the median pair farther apart than the others and including an orange stripe. Spiracles black. Setigerous tubercles in black spots. Cervical shield and anal shield orange, setal insertions in black spots. Head probably orange, the setal insertions in black spots; mandible bearing a large basal process on oral face and three large teeth and a long finely crenulate dorsal margin on cutting edge.

Described from three alcoholic larvae: "Ithaca, N. Y., Reared by J. G. Franclemont, July-August 1939, on *Oenothera biennis*" and one inflated larva collected near Carlstadt, N. J., August 15, by Charles Rummel.

*Distribution.*—Texas, Florida, Georgia, North Carolina, Illinois, Minnesota, Maryland, Pennsylvania, New Jersey, New York, and Wisconsin.

*Food plants.*—Grape, *Oenothera biennis* (teste Franclemont), and *Ludwigia* (teste Brimley).

## Subfamily ACRONYCTINAE

No characters have been found which would completely separate the Pantheinae from the Acronyctinae. The two groups have a number of peculiarities in common and are considered here as representing a single subfamily. *Polygrammate* is included, as is also *Agriopodes* as represented by *fallax* H.-S. "*Agriopodes*" *teratophora* H.-S. is a quite different insect.

Among the peculiarities shared more or less fully by both the Acronyctinae and the "Pantheinae," and which are rare or absent in the other subfamilies, the following may be noted:

In the normal members of both groups the usual single-haired setigerous tubercles are replaced by multisetiferous "warts" (verrucae); secondary hairs are present on the prolegs and secondary hairs are usually present on the head in the "Pantheinae" but are restricted to *Acronycta fragilis* in the Acronyctinae proper.

Except in *Raphia*, the head is peaked near the posterior margin and descends abruptly into the occipital sinus. Ocellus II usually is not circular and is often remarkably elongate as in *Panthea* and some species of *Acronycta*.

The silk pore of the spinneret usually is not strictly apical but is located definitely on the dorsal surface, sometimes well back from the tip as in *Charadra* and some species of *Acronycta*.

1. Setigerous tubercles I (I\*) on mesothorax borne subapically on a pair of conical, fleshy, middorsal projections. Setigerous tubercle VI on the abdomen with but one seta.----- *Raphia*
- Setigerous tubercle I on mesothorax not borne on a fleshy projection. Setigerous tubercle VI on the abdomen usually with several to many setae and never with less than two setae.----- 2
2. With secondary hair on the head. Many setae present on inner (ventral) face of femur.----- 3
- Without secondary hair on the head except in *Acronycta fragilis* in which but two setae are present on inner face of femur.----- 6
3. Front coxae freely movable and capable of being widely separated. Hind coxae, at most, but very slightly separated. Labrum large, reaching nearly to ventral margin of mandible. Legs extraordinarily stout.----- *Panthea*
- Front coxae fixed, touching. Hind coxae at least one-third the femur width apart (10:30). Labrum diminutive, reaching less than half way to ventral margin of mandible. Legs not noticeably stout.----- 4
4. Body hairs long, fine, and soft. No hair pencils or tufts present.----- *Charadra*
- Body hairs bristly.----- 5
5. Black hair pencils present on setigerous tubercle (chalaza) II on mesothorax and transverse middorsal tufts of red or black hair present on setigerous tubercle (chalaza) I on abdominal segments 1 and 8. Skin pavement granulose. Two apical setae on tarsus broad, spatulate. Of northern distribution.----- *Octocasia*
- No dorsal hair tufts or pencils. Skin smooth. All tarsal setae slender, pointed. Occurs in Florida, Texas, Arizona, and California.----- *Lichnoptera*
6. Setigerous tubercle A<sup>3</sup> equidistant between ocelli I and II or nearer to ocellus I except in *Acronycta funeralsis* (20:25) in which setigerous tubercle II on each abdominal segment bears a long, flattened, black seta.----- *Acronycta, Merolonche, Simyra*
- Setigerous tubercle A<sup>4</sup> distinctly nearer to ocellus II than to I (15:18). Without modified setae.----- 7
7. Setigerous tubercle (chalaza) VI on thorax bearing many setae. Setigerous tubercles (chalazae) I on the abdomen approximately as close to each other as to II. No dorsal hump on abdominal segment 8.----- *Agriopodes*
- Setigerous tubercle (chalaza) VI not bearing more than four setae on any thoracic segment. Setigerous tubercles I on the abdomen much nearer to II than to each other.----- 8
8. Setigerous tubercle VI with two setae on prothorax and one seta each on remaining thoracic segments. No dorsal hump on abdominal segment 8.----- *Polygrammate*
- Setigerous tubercle VI with four setae on prothorax and three each on mesothorax and metathorax. A very prominent hump on dorsum of abdominal segment 8.----- *Harrisimemna*

### RAPHIA Hbn.

1. Oral face of mandible abruptly, deeply excavated on apical fourth with a large molar area on the truncate base of the pocket so formed. Hind coxae about one-fifth the femur width apart (4:20).----- 2
- Oral face of mandible sloping gradually to near the cutting margin, without a molar area. Hind coxae two-thirds the femur width apart (17:23).----- *pallula*
2. Fleshy middorsal projections on mesothorax broadly, bluntly conical, the transverse basal width greater than the height (24:19).----- *coloradensis*
- Fleshy middorsal projections on mesothorax narrowly conical, much higher, the transverse basal width much less than the height (28:43).----- *frater*

### RAPHIA PALLULA Hy. Edw.

Head 3.4 mm. broad; skin smooth; head and body pale bluish green, anal shield green with white lateral and posterior margins. Spiracles white with brown rim. Setae I\* on mesothorax borne subapically on a pair of low, broadly subconical middorsal projections. Head green, with obscure, coarse granules on the occiput; oral face of mandible sloping obliquely on apical half to near the cutting margin without a basal molar area.

Described from a larva removed from the cocoon, contracted and de-colored preparatory to pupation. The larva collected at Superior, Ariz., May 3, 1938, on poplar. From a cocoon collected at the same time a moth emerged September 10, 1938, which was tentatively determined as *pallula* by Clarke. Moth No. 624 in U. S. National Museum.

*Distribution*.—California, Arizona, Nevada, Utah, and Colorado.

*Food plant*.—Poplar.

### RAPHIA COLORADENSIS Put.

Head 3.4 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of about equal width to 7, 8 somewhat broadened; skin smooth; general color green with occasional purple flecks.

Middorsal pale line represented by a yellow dot near posterior margin of each abdominal segment. A transverse yellow dorsal line on 8 margined anteriorly by a purple line. A transverse yellow line margined anteriorly with purple at base of each anal proleg posteriorly. Spiracles white with pale brown rim. Setigerous tubercles yellow, round in outline, almost flat; I\* on mesothorax borne subapically on a middorsal pair of low, bluntly subconical projections which are purple apically. Head pavement granulose, the small granules interspersed among large somewhat elevated granules, green, unmarked except that the epipharynx, labrum, antennae, and basal two-thirds of mandible are white.

Described from 5 larvae collected in July and August in eastern Washington and 1 inflated larva from U. S. National Museum.

*Distribution*.—Washington, Montana, California, Utah, Colorado, Nebraska, New Mexico, and Texas.

*Food plant*.—Poplar.

### RAPHIA FRATER Grt.

Head 3.4 mm. broad. Body about 30 mm. long and 5 mm. broad, abdominal segments of about equal width to 8 which is distinctly broadened; skin smooth; general color green sparsely flecked with red.

Transverse red spots present dorsally on abdominal segments 1, 5, and 8, apparently bordered posteriorly by a pale area. Setigerous tubercles pale, round in outline, moderately large and nearly flat except V and VI; I\* on mesothorax borne subapically on a small, narrowly conical process. Spiracles white with brown rim. Numerous secondary hairs on prolegs. Head bearing coarse, scattered, slightly elevated granules, green, unmarked.

Described from one inflated larva from U. S. National Museum labeled "Lincolnton, Me., Aug. 1908, coll. H. G. Dyar," and one immature larva beaten from cottonwood near Naches, Wash., July 27, 1940.

*Distribution*.—Washington, Utah, Colorado, Texas, Minnesota, Illinois, Pennsylvania, New York, Massachusetts, New Hampshire, and Maine. Canada: Quebec, Ontario, Manitoba, and British Columbia.

*Food plants*.—Poplar and willow.

## PANTHEA Hbn.

1. A dorsal hair pencil from verruca I present on mesothorax. Middorsal pale line not broadened to include verruca I on abdominal segments..... 2  
No dorsal hair pencils on mesothorax. Middorsal pale line conspicuously broadened anteriorly on abdominal segments, including verruca I. Hairs in hair pencils on prothorax and abdominal segments 1 and 8 scarcely at all broadened apically, not at all spatulate. Head freckles black. *acronyctoides*
2. Some hairs decidedly spatulate apically in the hair pencils on prothorax, mesothorax and abdominal segments 1 and 8. Head freckles brown. *furcilla*  
Hairs gradually broadened apically but not at all spatulate in the hair pencils. Head freckles black..... *angelica* (?)

## PANTHEA FURCILLA (Pack.)

Head 3.4 mm. broad. Body about 40 mm. long and 7 mm. broad at middle, tapering somewhat posteriorly; skin smooth; said to occur in both a reddish or brownish phase and a black phase. The reddish or brownish form is described below.

Body brown or reddish, more or less flecked with black. A broken pale middorsal line margined on posterior half of abdominal segments by a dark stripe which curves between verrucae I and II anteriorly. An obscure pale line ventrad of II. A sinuous dark stripe in the line of the spiracles. Spiracles white. A sinuous, pale, subventral stripe broken at V. Venter apparently pale, flecked with black. Verrucae large, elevated, pale, bearing sparse, spreading tufts of short brown or black hairs, replaced by slender black hair pencils anteriorly on prothorax, from I on mesothorax and from II on abdominal segments 1 and 8, some of the hairs in the hair pencils decidedly spatulate apically. Head with numerous secondary hairs, pale, closely freckled with brown; a U-shaped pale mark above apex of front, and pale markings posterior to the ocelli.

Described from four inflated larvae from U. S. National Museum labeled "Pergande, Washington, D. C." and one alcoholic specimen collected at Nicasious Lake, Maine, September 3, 1931, on *Pinus strobus*, by A. E. Brower.

*Distribution.*—Florida, North Carolina, District of Columbia, New Jersey, Pennsylvania, New York, Massachusetts, New Hampshire, and Maine.

*Food plants.*—Tamarack (*Larix*) and pine.

## PANTHEA ACRONYCTOIDES (Wlk.)

Head 3.7 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering distinctly posteriorly; skin smooth; general color black and white and there is some evidence of a black phase.

Dorsum black to base of prolegs with white markings. A white middorsal line conspicuously broadened anteriorly on anterior abdominal segments, including verruca I. A broken pale line, sometimes absent, in the line of verruca III. A strong, sinuous, subventral white stripe including verruca V and bent upward above level of spiracles near juncture of segments. Spiracles pale yellowish, in the dark coloration. Venter livid pale with obscure dark median spots. Verrucae slightly convex, pale, bearing spreading clusters of pale yellowish hairs and a few dark hairs; the clusters replaced by short pencils of black hairs anteriorly on prothorax and on verruca II on abdominal segments 1 and 8 in which the hairs are scarcely at all broadened apically, no trace of hair pencils on mesothorax. Head bearing numerous fine, pale, secondary hairs, smooth, a black area above antennal insertion and black freckles on remainder of head excepting a brown margin to the adfrontal areas, divided at their apex, including P<sup>1</sup> and P<sup>2</sup> and extending to posterior margin of head.

Described from 2 inflated and 6 alcoholic larvae collected by the Canadian Forest Insect Survey in Ontario and Quebec during August and September and received through the kindness of Mr. A. W. A. Brown, and two larvae collected on the eastern slope of the Cascade Mountains in Washington in August and early September. Brown and McGuffin (5) give an account of this larva with good figures.

*Distribution.*—United States: Washington, Minnesota, Wisconsin, New York, Massachusetts, New Hampshire, and Maine. Canada: Quebec, Ontario, and Manitoba.

*Food plants.*—Species of spruce, and Douglas-fir.

### PANTHEA ANGELICA (Dyar)

Head 3.6 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering posteriorly; skin smooth; general color white reticulate and spotted with black or black with the head and body almost without markings. The paler phase is described.

Body white, heavily reticulate with black. A strong, white, middorsal line, broadened at posterior margin of segments, not including verruca I. An obscure white line in the line of verruca III. A sinuous, white, subventral stripe, bent upward above level of spiracles near juncture of segments. Spiracles pale yellow. Venter brownish. Verrucae pale brown, the dorsal bearing spreading clusters of mostly strong black hairs intermingled with pale hairs; the clusters replaced by long pencils of black hairs anteriorly on prothorax, from verruca I on mesothorax and from II on abdominal segments 1 and 8, the mesothoracic pencil less strongly developed, hairs but slightly broadened apically, not at all spatulate. Head bearing numerous secondary hairs, smooth; a black area above antennal insertion, remainder of head closely freckled with black excepting a brown margin to the adfrontal areas, divided at their apex, including  $P^1$  and  $P^2$  and extending to posterior margin of head.

Described from three larvae collected by W. W. Baker: one at Rainbow Forest Camp on the Olympic Peninsula of Washington, July 21, 1935, and two at Bumping Lake (elev. 3,470 ft.) on east slope of Cascade Mountains in Washington on August 1, 1937. A larva spun up for pupation September 4, 1937, and the moth emerged April 7, 1938, and was tentatively determined as *angelica* by Clarke. Moth No. 622 in U. S. National Museum.

*Distribution.*—California and Washington.

*Food plant.*—Douglas-fir.

### CHARADRA (Wlk.)

#### CHARADRA DERIDENS (Gr.)

Head 4.3 to 5 mm. broad. Body about 40 mm. long and 8 mm. broad at middle, tapering slightly posteriorly; skin bearing very minute upright granules; general color pale greenish gray.

Body without markings. Verrucae distinct, bearing clusters of long, fine, whitish hairs; no secondary hairs or hair pencils. Spiracles white. Head smooth, bearing numerous long secondary hairs, usually black but sometimes whitish tinged with green; when black with a transverse yellow spot across front extending to dorsad of the ocelli, broken by the narrow black adfrontal areas, and pale ventrally, posterior to the ocelli and in a posterior area on occiput; when whitish with the adfrontal areas black, a black bar across base of front and including some of the ocelli and sometimes with a black transverse mark above apex of front.

Described from four inflated larvae from U. S. National Museum; two inflated larvae from the Brooklyn Museum and one live larva collected near Clarksville, Tenn., July 21, 1920. This larva pupated July 23, 1920, and produced a moth August 6, 1920, which was determined by Dyar and is now in the National Museum.

*Distribution*.—United States: Minnesota, Colorado, Texas, Florida, North Carolina, Tennessee, Arkansas, New Jersey, Pennsylvania, New York, Massachusetts, and Maine. Canada: Nova Scotia, Quebec, and Manitoba.

*Food Plants*.—Oak, birch, and elm.

### COLOCASIA Ochs.

1. Head not black. Dorsum of body white or pale..... *propinquilinea*  
 Head and body black..... *flavicornis*

It may be that *propinquilinea* and *flavicornis* are but color phases of one species as is found in *Panthea*.

### COLOCASIA PROPINQUILINEA (Grl.)

Head 4.2 mm. broad. Body about 30 mm. long and 6 mm. broad at middle, tapering distinctly posteriorly; skin finely pavement-granulose; general color pale with pale verrucae.

Body white except as indicated. The pale verrucae bearing spreading clusters of short, rather stiff, white or yellow hairs except that II on mesothorax bears a long, slender pencil of black hairs and verrucae I on abdominal segments 1 and 8 bear a common, short, transverse, tuft of red or black hairs. A black stripe including the spiracles and extending dorsally at the incisures. Spiracles white. A sinuous white subventral stripe and a black stripe in the line of verruca VI. Cervical shield white. Head smooth, red or brown ("white with angular red blotches," Dyar (39)) with numerous secondary hairs.

Described from two inflated larvae in the U. S. National Museum labeled, respectively: "No. 2856, Sept. 19, 1882, unbred" and "coll. H. G. Dyar."

*Distribution*.—United States: Tennessee, Pennsylvania, New Jersey, New York, Connecticut, Massachusetts, New Hampshire, and Maine. Canada: Quebec and Ontario.

*Food plants*.—Birch, walnut, maple, oak, and beech.

### COLOCASIA FLAVICORNIS (Sm.)

Head 4.1 mm. broad. Body about 38 mm. long and 9 mm. broad at middle, tapering somewhat posteriorly, skin finely pavement-granulose; general color black with pale verrucae.

Body black, except as noted. Verrucae contrastingly pale (probably yellow), bearing numerous pale or yellowish hairs except that II on the mesothorax bears a long, slender pencil of black hairs and verrucae I on abdominal segments 1 and 8 each bear a common, transverse tuft of black hairs. Broken lighter lines of indeterminate color in the line of verruca II and traces of a sinuous pale stripe ventrad of the spiracles. Spiracles probably orange or reddish. Head smooth, black, unmarked, with numerous secondary hairs, ocellus II elongate.

Described from two alcoholic larvae reared from the egg at Ithaca, N. Y., May-July 1940, by J. G. Franclemont.

*Distribution*.—Pennsylvania, New Jersey, New York, and Maine.  
*Food plant*.—Hickory (*Carya ovata*) (teste Franclemont).

## LICHNOPTERA H.-S.

## LICHNOPTERA DECORA (Morr.)

Head 5.5 mm. broad. Body about 45 mm. long and 7 mm. broad at middle, tapering gradually posteriorly; skin smooth; general color indicated below.

A very broad pale stripe including the spiracles, extending dorsally to well dorsad of verruca III and ventrally to V, with a sinuous, broken black line in the line of the spiracles. Dorsum of prothorax, most of metathorax and ninth abdominal segment pale. Remainder of dorsum black with a black middorsal line outlined intermittently with white which may be diffused over much of the dorsum of abdominal segments 4 and 5. Venter black. Spiracles white. Verrucae large, convex, bearing numerous long, stiff, dark brown setae intermingled with a few pale, unbarbed setae. No hair tufts or pencils. Head bearing numerous secondary hairs, smooth, brown, without markings except that the adfrontal sutures and median line are white; mandible without teeth on cutting margin, with a strong basal process bearing an apical molar area.

Described from two alcoholic larvae from U. S. National Museum labeled "Apricot leaf, Nogales, Ariz., Sept. 1, 1940, Lots 40-20405-20406, Nogales Nos. 39694 and 39696. Assoc. adults det. J. F. G. C."

*Distribution*.—California, Arizona, Texas, and Florida.

*Food plant*—Apricot.

## ACRONYCTA Ochs.

## MEROLONCHE Grt.

## SIMYRA Ochs.

1. With abundant secondary hairs which conceal the dorsal setal groups except when these are in the form of dorsal hair pencils. Skin bearing very minute rounded granules. Head smooth.----- 4  
Secondary hair sparse or absent, not concealing the dorsal setal groups. No dorsal hair pencils except in *Acronycta impleta*. Skin usually bearing minute, spinelike granules. Head smooth or granulose.----- 2
2. Setigerous tubercle VI bearing two setae on prothorax and but one each on mesothorax and metathorax. Verrucae reverted to setigerous tubercles and a single-haired condition except on VI on the abdomen.----- 20  
Setigerous tubercle VI with many setae on each thoracic segment.----- 3
3. With but 2 setae on inner face of femur. Line P<sup>1</sup>-P<sup>2</sup> above apex of adfrontal areas. With one to three setae on inner face of proleg slightly above the planta. Head usually granulose. Labrum with a narrow, almost parallel-margined notch in anterior margin.----- 9  
With seven or more setae on inner face of femur. Line P<sup>1</sup>-P<sup>2</sup> below apex of adfrontal areas. With numerous setae on inner face of proleg slightly above the planta. Head smooth. Labrum usually with a broad emargination in anterior margin.----- 25
4. With but two setae on inner face of femur. Secondary hair pale yellow or white.----- 5  
With four or more setae on inner face of femur. Dorsal secondary hair not pale.----- 8
5. Dorsal hair pencils present on some abdominal segments. Head entirely black except that the adfrontal areas and marks posterior to the ocelli may be brown.----- 6  
Dorsal hair pencils absent in the mature larva. Head not entirely black.----- *leporina*
6. Black dorsal hair pencils present on abdominal segments 1, 3, and 8 only, those on 1 and 3 widely separated and divergent.----- *americana*  
Black, or sometimes white, middorsal hair pencils usually present on most abdominal segments, close together forming a single middorsal pencil on abdominal segments 1 and 3.----- 7

7. Hair pencil present on abdominal segment 2. Venter pale. Distribution limited to areas east of the Rocky Mountains.----- *rubricoma*  
 Hair pencil absent on abdominal segment 2. Venter blackish. Distributed from the Atlantic to the Pacific Ocean.----- *lepusculina*
8. Secondary hairs directed outward, black or dark brown at base becoming dark apically, the tips white. Middorsal hair pencils not longer than the hair.----- *hastulifera*  
 Secondary hair unicolorous brown, directed dorsally forming a more or less distinct middorsal ridge. Middorsal hair pencils much longer than the hair.----- *dactylina, hesperida*
9. With but one seta on inner face of proleg slightly above the planta. Three setae on inner face of hind coxae. Setigerous tubercles I and II on each abdominal segment small but abruptly elevated, subcylindrical, bearing short, stout spines at apex. Dorsal coloration made up of transverse reddish stripes.----- *retardata*  
 With three setae on inner face of proleg slightly above the planta. Six or more setae on inner face of hind coxae. Setigerous tubercles I and II rarely cylindrical and then on anterior abdominal segments only. Never with transverse stripes.----- 10
10. With a dark or reddish dorsal stripe, abruptly broadened on abdominal segment 4.----- 17  
 Dorsal stripe absent or not broadened on abdominal segment 4.----- 11
11. Cervical shield entirely black except the middorsal pale line. Head, except laterally, of solid colors without freckles. Sparse dorsal secondary hair long, terete, slender.----- 12  
 Cervical shield not black. Head freckled with black. Sparse dorsal secondary hair often short and sometimes flattened.----- 15
12. Coloration to and including the spiracles composed of alternating light and dark lines with a distinct subventral pale stripe. Anterior half of head black, posterior half red or brown.----- 13  
 With a single dark dorsal stripe. No distinct subventral stripe. Red or brown less extensive on occiput.----- 14
13. With pale yellow lines middorsally, ventrad of setigerous tubercle II and including III and a bright yellow stripe ventrad of the spiracles. Venter black.----- *radcliffei*  
 The yellow lines and stripe of *radcliffei* dull greenish. Venter dull greenish.----- *tartarea* (?)
14. With a segmental series of coat-shaped black dorsal markings on the abdomen, including an anterior and a posterior red spot, the extended arms passing anterior to setigerous tubercle II. Head infuscated reddish. Ground color of body gray.----- *interrupta*  
 With a broken reddish middorsal line strongly margined with black. Head black with some red on the occiput. Ground color of body black.----- *furcifera*
15. Head with secondary hairs, smooth and without a red or orange spot on the occiput.----- *fragilis*  
 Head without secondary hairs, granulose and with a red or orange spot on occiput.----- 18
16. Black freckles on head very fine, the group not tending to be fused at the posterior margin and not sharply outlining the orange spot on the occiput. Area about setigerous tubercles III and V concolorous with adjacent parts.----- *betulae*  
 Black freckles on head moderately large, tending to fuse at posterior margin forming a line sharply outlining the red spot on the occiput. Setigerous tubercles III and V in small yellow spots.----- *innotata*
17. No hump on dorsum of abdominal segment 8. Cervical shield unicolorous green.----- *lithospila* (?)  
 A strong, angular hump on the dorsum of abdominal segment 8.----- 18
18. Setigerous tubercle I on mesothorax, metathorax, and abdominal segments 1 and 2 small but abruptly elevated, subcylindrical. Cervical shield red with a conspicuous white margin. Head nearly entirely smooth.----- *pruni*  
 Setigerous tubercle I conical or rounded on thorax and anterior abdominal segments. Cervical shield without a white lateral margin. Head granulose.----- 19

19. Secondary hairs of dorsum numerous, short, flattened, white. Head with a red spot on the occiput broadly bordered anteriorly with black. Cervical shield with broad black lateral margin. Spiracles black, not set in red spots.----- *morula*
- Secondary hairs of dorsum sparse or absent, long and setiform when present. Head purplish freckled with black. Cervical shield purplish, unmarked. Spiracles white, set in small red spots.----- *prisca*
20. Setigerous tubercle II on at least some abdominal segments bearing a very long black seta broadened and flattened toward the tip.----- 21
- Setigerous tubercle II bearing a small, inconspicuous normal seta throughout.----- 22
21. No secondary hairs on prolegs. Head and body black. Each segment of thorax and abdomen with an elevated yellowish dorsal spot including setigerous tubercles I and II. Skin with minute rounded granules. Height of spiracle equal to less than twice the width (10:7)----- *funeraria*
- Secondary hairs on the prolegs. Head and body brown, without dorsal spots including I and II. Skin bearing small spinules. Height of spiracle equal to twice the width (15:7)----- *afflicta*
22. Setigerous tubercle I, and sometimes II, in a white or yellowish spot.----- 23
- Area about setigerous tubercles I and II concolorous with the reddish brown dorsum. The only apparent markings a pale middorsal line margined by dark lines. Spiracles entirely black.----- *hucitata*
23. Setigerous tubercle I in a large, rounded, white spot, II normally in ventral end of an oblique white line which may be absent, the spots separated and margined by dark brown. Cervical shield bearing minute spinules.----- *incrata* (?)
- Setigerous tubercles I and II in yellow spots.----- 24
24. Spots surrounding setigerous tubercles I and II outlined and separated by reddish brown. Cervical shield without spinules. Head reticulation intensified to black in an area including setae 1<sup>a</sup> and 2<sup>a</sup>.----- *modica* (?)
- Setigerous tubercles I and II in a common dull yellowish spot not outlined with reddish. Cervical shield bearing small spinules. Head reticulation not as above.----- *marmorata*
25. Head, skin, and setae reddish.----- *sperata*
- Head black or marked with black.----- 26
26. Setigerous tubercles I and II of each side almost contiguous on abdominal segment 8, bearing a common subdorsal pencil of black hairs. Compact tufts of feathery hairs dorsally on metathorax and abdominal segments 1 and 2.----- *impleta*
- Setigerous tubercles I and II well separated on abdominal segment 8 and not bearing a hair pencil. No conspicuous dorsal tufts on anterior segments.----- 27
27. With conspicuous white or yellow markings on body.----- 32
- Skin black dorsally, without markings except a red or brownish stripe or spots in line of setigerous tubercle V.----- 28
28. Dorsal setae brown or yellow.----- 29
- Dorsal setae black.----- 31
29. Dorsal setae brown throughout.----- 30
- Dorsal setae bright reddish brown on thorax and on abdominal segments 1, 8, and 9, yellow or yellow and black on remaining segments. Skin black throughout excepting in a brownish spot anterior to V on abdominal segments.----- *distans*
30. Skin black on the dorsum nearly to the spiracles, brown elsewhere. Spiracles white. Cervical shield black. Space between setigerous tubercles I on abdominal segment 5 much greater than the greatest width of I (40:28).----- *impressa*
- Skin black throughout. Spiracles deep infuscated brown, appearing black. Cervical shield pale. Space between tubercles I on 5 not greater than the greatest width of verruca I (40:42).----- *Microtonche ursina*
31. Head black with a brownish line on occiput including setigerous tubercle P<sup>2</sup>. Feathery hairs very sparse among setae on dorsum.----- *pradita*
- Head black with a large brownish area on occiput including setigerous tubercle P<sup>2</sup>. Feathery hairs usually abundant among setae on dorsum.----- *noctivaga*

32. Spiracles, skin, and setae black, without white or yellow subdorsal markings but with a conspicuous white subventral stripe interrupted at tubercle V.----- *barnesi*  
 Spiracles white except brown in *lancolearia*. Setae mostly pale, sometimes intermingled with a few strong black setae on cervical shield and verrucae I to III. With subdorsal white or yellow markings except in *lancolearia* in which the skin is pale greenish.----- 33  
 33. Head with a pale line on occiput including setigerous tubercle P<sup>2</sup>----- 35  
 Head without a pale line on occiput including setigerous tubercle P<sup>2</sup>----- 34  
 34. Setigerous tubercles I and II pale to white on metathorax and abdominal segments 2 to 8, other tubercles black excepting V which is red and set in a red spot interrupting the white to reddish subventral stripe.----- *longa* (?)  
 Setigerous tubercles reddish, orange or black. Subventral stripe yellow.----- *oblinita*  
 35. Setigerous tubercles reddish or orange. Cervical shield black.----- *Simyra henrici*  
 Setigerous tubercles greenish. Cervical shield pale.----- *lancolearia*

## ACRONYCTA LEPORINA (L.)

Head 4 to 4.3 mm. broad. Body about 40 mm. long and 7 mm. broad at middle, tapering somewhat posteriorly; skin bearing very minute rounded granules; general color of skin greenish white, unmarked or marked with black.

Body greenish white, sometimes with a series of small dark middorsal spots at verrucae I, these verrucae without hair pencils in the mature larva. Hair white or yellow, abundant, lax, and very long, with a few black hairs at the extremities. Spiracles blackish with pale margin. Head pale green, immaculate, or more or less marked with black.

Described from three larvae collected in western Washington in September by Joseph Wilcox and the writer and one inflated larva from U. S. National Museum labeled "No. 1272, Kaslo, B. C., coll. H. G. Dyar."

*Distribution.*—United States: Washington, Colorado, New Mexico, Illinois, Indiana, Pennsylvania, New York, Massachusetts, New Hampshire, and Maine. Canada: Ontario, Manitoba, Alberta, and British Columbia.

*Food plants.*—Willow, poplar, and birch.

## ACRONYCTA AMERICANA (Harr.)

Head 5.6 mm. broad. Body about 50 mm. long and 8 mm. broad at middle, tapering posteriorly; skin pavement granulose; general color of skin greenish white marked more or less with black.

A middorsal dark stripe best developed on abdominal segments 7, 8, 9 and the anal shield; a dark stripe including the spiracles and a blackish shade on the venter may be more or less apparent. Hair light yellow. Two well-separated, divergent pencils of black hair dorsally on abdominal segments 1 and 3 and a single middorsal black hair pencil on abdominal segment 8. Spiracles dusky with the extreme centre pale. Head smooth, black, the adfrontal sutures pale.

Described from four larvae collected at Clarksville, Tenn., in August and one inflated larva collected at Arlington, N. J., August 20 by Chas. Rammel.

*Distribution.*—Utah, Arizona, Colorado, Minnesota, Iowa, Illinois, Nebraska, Kansas, Texas, Florida, Georgia, North Carolina, Tennessee, Virginia, Maryland, New Jersey, Pennsylvania, New Hampshire, Maine, and the adjacent Provinces of Canada.

*Food plants.*—Oak, redbud (*Cercis*) and reported from maple, linden, locust, witch-hazel, elm, chestnut, poplar, birch, alder, hickory, ash, and sycamore.

## ACRONYCTA RUBRICOMA Gn.

Head 4.5 mm. broad. Body about 40 mm. long and 8 mm. broad at middle, tapering somewhat posteriorly; skin bearing very minute, rounded granules; general color of skin greenish, usually more or less marked with black.

Skin greenish, a dark dorsal stripe usually present including a segmental series of small but distinct middorsal black spots formed by the fusion of verrucae I, these verrucae usually bearing a common pencil of black or pale hairs on most abdominal segments. Hair white or pale yellow, long and lax laterally. Spiracles white. Venter pale. Head smooth, black, the adfrontal sutures white.

Described from one inflated larva from U. S. National Museum labeled "F. Knab, Washington, D. C."

*Distribution.*—Texas, Kansas, Nebraska, Missouri, Iowa, Kentucky, Maryland, Pennsylvania, and New York.

*Food plants.*—Hackberry and elm.

## ACRONYCTA LEPUSCULINA Gn.

Head 4.5 mm. broad. Body about 40 mm. long and 8 mm. broad at middle, tapering posteriorly; skin bearing very minute, rounded granules; general color of skin yellow or greenish yellow more or less marked with black.

Dorsum blackish medially, becoming paler laterally to verruca II, with black middorsal hair pencils on most abdominal segments. A blackish stripe from III to and including the spiracles margined dorsally and ventrally by pale lines. Hair long and lax, yellow or white. Spiracles dusky yellowish brown. Venter blackish. Head smooth, black, sometimes with the adfrontal areas and markings posterior to the ocelli brown.

Described from two larvae collected at Fairfax, Wash., and near Glacier, Wash., in August by W. W. Baker and one inflated larva from U. S. National Museum labeled "No. 1250, Kaslo, B. C., coll. H. G. Dyar."

*Distribution.*—Washington, Oregon, Montana, California, Arizona, Utah, Colorado, North Dakota, South Dakota, Minnesota, Nebraska, Kansas, Iowa, Missouri, Illinois, Ohio, Pennsylvania, New York, New Hampshire, Maine, and all of the adjacent Provinces of Canada from Nova Scotia to British Columbia.

*Food plants.*—Alder and poplar.

## ACRONYCTA HASTULIFERA A. &amp; S.

Head 5.7 mm. broad. Body about 55 mm. long and 8 mm. broad at middle, tapering posteriorly; skin bearing very minute rounded granules and dense, short, secondary hairs; skin black.

Body black throughout. Secondary hairs black middorsally with the extreme tip white forming slight tufts on abdominal segments 1, 3 and 8; elsewhere a bright brown growing darker toward the tips with the extreme tip white. Spiracles white. Head smooth, black, without markings.

Described from 1 inflated larva in U. S. National Museum labeled "On Alnus, Falls Church, Va., September 25, 1915, Middleton coll.;" 1 inflated larva, without data, from the Brooklyn Museum; and 1 inflated larva collected at Arlington, N. J., September 10, by Chas. Rummel.

*Distribution.*—New York, Massachusetts, Connecticut, New Jersey, Pennsylvania, Maryland, Virginia, and Illinois.

*Food plant.*—Alder.

## ACRONYCTA DACTYLINA (Grt.)

Head 4.8 mm. broad. Body about 40 mm. long and 8 mm. broad, tapering slightly posteriorly; skin bearing minute, rounded granules; skin black, dorsal hair brown.

Skin black throughout, bearing dense segmental transverse bands of unicolorous secondary hairs which are brown dorsally to verruca III and pale yellowish or white ventrad of this to base of prolegs; these hairs directed dorsally forming a more or less distinct middorsal ridge. Black middorsal hair pencils present on abdominal segments 1, 3, and 8. Spiracles white. Head smooth, black, unmarked.

Described from one inflated larva from U. S. National Museum and numerous larvae, indistinguishable from this, collected in western Washington in September and October from which moths, determined as *hesperida* Sm., emerged in May and June.

*Distribution*.—Maine, New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, Maryland, Kentucky, North Carolina, Illinois, Minnesota, Colorado, Montana, Idaho, Washington, and all of the adjacent Provinces of Canada.

*Food plants*.—Alder, willow, and reported from birch.

## ACRONYCTA RETARDATA (Wik.)

Head 3 mm. broad. Body about 27 mm. long and 4 mm. broad at middle, tapering posteriorly; skin bearing minute spinules, more evident ventrally; general color pale with transverse purplish stripes on the dorsum.

Each segment except the prothorax with five transverse dark purplish dorsal stripes extending almost to the line of the spiracles, the band including setigerous tubercle II broken dorsally between the tubercles. Venter pale much marked with yellowish white. Spiracles black. Setigerous tubercle I on the abdomen distinctly larger than II, both very strongly elevated, subcylindrical, bearing numerous short, stout setae apically, III strongly roundly elevated, other tubercles inconspicuous but all except VIII bearing more than one seta. Head smooth, pale, freckled with pale brown, the freckles darker along the median line.

Described from one inflated larva in U. S. National Museum labeled "Falls Church, Va., Aug. 20, 1904, on maple, N. Banks coll."

*Distribution*.—United States: Nebraska, Kansas, Iowa, Illinois, Mississippi, Georgia, North Carolina, Kentucky, Maryland, Pennsylvania, Connecticut, Massachusetts, New York, and Vermont. Canada: Quebec and Ontario.

*Food*.—Maple.

## ACRONYCTA RADCLIFFEI (Harv.)

Head 4 mm. broad. Body about 30 mm. long and 5 mm. broad, abdominal segments of about equal width to 8 which bears a slight dorsal hump; skin bearing coarse granules produced as short spinules; general color black with pale yellow longitudinal markings.

Body black with slender pale yellow lines middorsally, ventrad of verruca II and including III. Spiracles black, in the dorsal coloration. Subventral stripe bright yellow, including V. Venter black. Each verruca bearing a few white hairs, I and II on abdominal segment 8 most prominent. Head roughened but not granulose, entirely black anterior to the apex of the adfrontal areas, entirely reddish posteriorly.

Described from 10 larvae collected both east and west of the Cascade Mountains in Washington in August and September by W. W. Baker, C. W. Getzendaner, and the writer. Larvae determined from

Dyar's Key (39) and from an inflated specimen in U. S. National Museum.

*Distribution.*—United States: Virginia, Tennessee, Illinois, Iowa, Pennsylvania, New Jersey, New York, Massachusetts, New Hampshire, and Washington. Canada: British Columbia, Manitoba, and Nova Scotia.

*Food plants.*—Serviceberry (*Amelanchier florida*), cultivated cherry, mountain-ash (*Pyrus occidentalis*), apple, and reported from wild cherry and plum.

#### ACRONYCTA TARTAREA Sm. (?)

Head 4 mm. broad. Body about 30 mm. long and 5 broad, abdominal segments of about equal width to 8 which bears a slight dorsal hump; skin bearing coarse granules produced as short spinules; general dorsal color to II black, green ventrally.

Body black dorsally to and including setigerous tubercle II with dull greenish lines middorsally and ventrad of II; remainder of body dull greenish. Spiracles black. Verrucae small, inconspicuous, flat, each bearing a few long pale hairs. Cervical shield black. Head roughened but not granulose, anterior half black, posterior half brown rather than red.

Described from one larva collected at Naselle, Wash., September 7, 1939, by C. W. Getzender. This larva produced a moth (No. 747 in U. S. National Museum), June 11, 1940, which was determined by Clarke as *Acronycta radcliffei* with the statement that the specimen had the coloration of *tartarea* but that he did not consider this to be distinct from *radcliffei*.

*Distribution.*—United States: Idaho, Washington, and New York. Canada: New Brunswick, Quebec, Ontario, Alberta, and British Columbia.

*Food plant.*—Apple.

#### ACRONYCTA INTERRUPTA Gn.

Head 3.9 mm. broad. Body about 25 mm. long and 5 mm. broad at middle, tapering slightly posteriorly with a peculiar abruptly elevated, black, dorsal hump on abdominal segment 8; skin bearing small spinules; general color "purplish or flesh color" (Dyar).

Dorsum to midway between setigerous tubercles II and III paler than remainder of body with a broad, dark middorsal stripe including a segmental series of coat-shaped black spots, the extended arms anterior to II, and including an anterior and a posterior red spot. Traces of a pale stripe including the spiracles. Spiracles blackish at margin, the extreme centre pale. Setigerous tubercles small, inconspicuous, I and II slightly elevated, each bearing one strong seta and a few smaller ones; setae generally weak and pale. Cervical shield black. Head coarsely granulose, reddish, obscurely darkened on anterior three-fourths, adfrontal areas, median line of front and an area posterior to the ocelli white.

Described from one inflated larva collected by Charles Rummel in New Jersey on August 30.

*Distribution.*—United States: Colorado, Nebraska, Kansas, Minnesota, Iowa, Illinois, Arkansas, Florida, Georgia, North Carolina, New Jersey, Pennsylvania, New York, Massachusetts, New Hampshire, and Maine. Canada: Ontario.

*Food plants.*—Elm, apple, plum, birch, and wild cherry.

## ACRONYCTA FURCIFERA Gn.

Head 5 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering posteriorly, faintly, roundly elevated middorsally on abdominal segments 1, 2, and 8; skin bearing spinules; general color black with a broken red middorsal stripe.

A broken red middorsal stripe present from mesothorax to abdominal segment 7, strongly margined with black which includes setigerous tubercle I, the black margin alone present on 8 and 9. Spiracles black. Setigerous tubercles small, nearly flat, I to III bearing but about 3 to 6 setae each, I dark, the remaining tubercles paler than the ground color of body. Head strongly granulose black, pale laterally with a few dark freckles, a reddish area posteriorly on occiput.

Described from one inflated larva in U. S. National Museum labeled "Falls Church, Va., Octo. 4, 1915, on *Prunus*, De Greyse coll.," and one inflated larva collected at Arlington, N. J., August 10, by Chas. Rummel and sent as "*hastata*."

*Distribution*.—United States: Florida, Georgia, North Carolina, Tennessee, Virginia, New Jersey, Pennsylvania, Ohio, Illinois, Connecticut, Massachusetts, New York, and Maine. Canada: Nova Scotia, Quebec, Ontario, Manitoba, and Saskatchewan.

*Food plants*.—Wild cherry (*Prunus serotina*) and related species.

## ACRONYCTA FRACILIS (Gn.)

Head 3.1 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering posteriorly with a slight middorsal bump on abdominal segment 8; skin bearing small spinules; general color pale gray faintly tinged with green.

A dark middorsal stripe, intensified on metathorax and abdominal segment 1, including setigerous tubercle I and not broadened on abdominal segment 4. No other body markings. Spiracles brown. Setigerous tubercles large, broadly convex, bearing a mixture of strong and short, slender black setae numbering about 6 or less on I to IV. Head smooth, with secondary hairs, pale green with a black stripe ventrally and a black line posterior to ocellus I dorsad of which is an area closely freckled with black and overlaid with reddish.

Described from 20 larvae collected at Naselle, Puyallup, and North Bend, Wash., in September and October by C. W. Getzendaner, W. W. Baker, and the writer. Moths emerged in May and June and were determined by Clarke.

*Distribution*.—Washington, North Carolina, New Jersey, Pennsylvania, New York, Vermont, New Hampshire, and all of the adjacent Provinces of Canada.

*Food plants*.—Prune, plum, apple, and rose.

## ACRONYCTA BETULAE Riley

Head 3.8 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering posteriorly; skin bearing small spinules; general color pale brownish.

Body brown with a greenish tinge, without markings except a faint middorsal pale line. Spiracles dusky at margin, the extreme centre white. Vernae I and II small, flat, black, each bearing about three small setae, the insertions pale. Head slightly granulose, brown, apparently tinged with purplish with very small black freckles, an orange area on the occiput.

Described from one inflated larva from U. S. National Museum labeled "Wash., D. C., July 20, 1899, on birch."

*Distribution*.—Iowa, Missouri, Georgia, North Carolina, District of Columbia, New Jersey, Pennsylvania, New York, and New Hampshire.

*Food plant*.—Birch.

## ACRONYCTA INNOTATA Gn.

Head 3.9 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering posteriorly with a slight dorsal hump on abdominal segment 8; skin bearing short spinules; general color dark greenish.

Body dark greenish almost without markings. Setigerous tubercles I and II small, almost flat, black, each with about three small setae. A small spot ventrad of I, another including III and one including V pale yellowish. Spiracles white. Cervical shield concolorous with adjacent parts. Head greenish freckled with black, the freckles fused posteriorly to form a line margining the occipital reddish spot anteriorly.

Described from one inflated larva in U. S. National Museum labeled "No. 1253, Kaslo Cr., B. C., H. G. Dyar coll."

*Distribution.*—North Carolina, New Jersey, Pennsylvania, New York, New Hampshire, Vermont, Maine, and the adjacent Provinces of Canada from Nova Scotia to British Columbia.

*Food plants.*—Hickory and birch.

## ACRONYCTA LITHOSPILA Grt.

Head 4.2 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering posteriorly; skin bearing minute, slender spinules; general color green with a prominent dark middorsal stripe abruptly broadened on abdominal segment 4.

Dark brown middorsal stripe beginning on mesothorax, passing between setigerous tubercles I to 4 where it is abruptly broadened to include II, and still further broadened on 5, then narrowing gradually, margined by a yellow line. Spiracles white, blackish at margin. Setigerous tubercles but slightly elevated, their setae very long, slender, and black, each seta on an independent projection. Cervical shield unicolorous green. The minute slender spinules anteriorly on the anal shield becoming relatively huge and spurlike on posterior one-fourth. Head with small, contiguous granules, green, a large yellowish area with P<sup>1</sup> and P<sup>2</sup> at inner margin overlaid with freckles, black posteriorly and gradually paler anteriorly.

Described from two inflated larvae received, without data, from the Brooklyn Museum through Geo. P. Engelhardt and determined by the writer from Dyar's key (39).

*Distribution.*—Colorado, Kansas, Minnesota, Missouri, Illinois, Maine, New York, Massachusetts, New Jersey, Pennsylvania, Maryland, North Carolina, Georgia, Mississippi, and Florida.

*Food plants.*—Hickory, oak, and chestnut.

## ACRONYCTA PRUNI Harr.

Head 3.5 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering posteriorly with a strong angular hump on abdominal segment 8; skin bearing small spinules; said to occur in both a green and a brown phase, the larva described apparently being of the brown phase.

Body brown with a greenish tinge. A dark reddish middorsal stripe, narrow on thorax and first three abdominal segments, abruptly broadened on 4 and tapering from 6 posteriorly; including a pale middorsal line and strongly margined with white on the mesothorax. Spiracles blackish at margin, the extreme centre white. Cervical shield red, the lateral margin conspicuous white. Verrucae small, bearing but a few setae and nearly or quite flat except I on mesothorax, metathorax, and abdominal segments 1 and 2, and II on 8 which are small but sub-cylindrical. Head nearly smooth, pale or greenish, marked with black splotches which tend to form longitudinal lines; the submedian arcs, a stripe above insertion of antenna and a stripe posterior to the ocelli, reddish.

Described from one inflated larva from U. S. National Museum labeled "Washington, D. C."

*Distribution.*—United States: Texas, Florida, Alabama, Georgia, North Carolina, District of Columbia, Nebraska, Kansas, Missouri, Illinois, Pennsylvania, New Jersey, Connecticut, New York, New Hampshire, and Maine. Canada: Nova Scotia.

*Food plants.*—Apple, mountain-ash, wild cherry, and plum.

#### ACRONYCTA MORULA G. & R.

Head 4.5 mm. broad. Body about 30 mm. long and 6 mm. broad at middle tapering posteriorly, large rounded dorsal humps on abdominal segments 1, 4, and 8; skin bearing small spinules; general color greenish gray.

A dusky middorsal stripe strongly constricted at the incisures, the color intensified to black in margining lines, including an indefinite middorsal pale line. Traces of a black line dorsal of III and of a black stripe including the spiracles. Spiracles black. Cervical shield pale with black lateral margins. Secondary hairs of dorsum short, white, decidedly flattened. Head obscurely granulose, a large pale or brown area below and posterior to the ocelli including lines of black freckles, adfrontal areas and the adjacent area pale or brown, front pale with black lateral margins; most of head posterior to level of adfrontal areas red, bordered anteriorly with black extending to include the ocelli.

Described from four alcoholic larvae collected near Chicago, Ill., by A. K. Wyatt.

*Distribution.*—United States: South Dakota, Nebraska, Kansas, Texas, Minnesota, Illinois, Missouri, North Carolina, Maryland, Pennsylvania, New York, and Maine. Canada: Nova Scotia, Quebec, Ontario, and Manitoba.

*Food plants.*—Elm, apple, and linden.

#### ACRONYCTA CRISEA Wlk.

Head 3.7 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering posteriorly, with small middorsal humps on abdominal segments 1 and 2 and a more pronounced hump on 8; skin bearing minute spinules; general color green with a purplish middorsal stripe broadened abruptly on abdominal segment 4 and following segments.

Body pale green throughout except as noted. A dark purplish middorsal stripe, broadened to include the cervical shield but otherwise narrow on thorax and abdominal segments 1 to 3, abruptly broadened on 4, still broader on 5 narrowing posteriorly, margined by an obscure pale line on 4 to 7 and including small green spots at juncture of segments on 1 to 7. Spiracles pale. A spot including each spiracle, another at outer base of legs and prolegs and apices of legs and prolegs, red. Setigerous tubercles small and but slightly elevated except rather large and somewhat elevated in the middorsal pair on thorax, I and II on 1 and 8 and I on 2 and 3. Head coarsely granulose, pale ventrad and posterior to the ocelli, otherwise purplish freckled with black, P<sup>1</sup> and P<sup>2</sup> in an unmarked line.

Described from eight larvae collected in western Washington in September by W. W. Baker and the writer. A moth emerged June 28, 1939, and was determined by Clarke.

*Distribution.*—California, Colorado, Washington, Idaho, Montana, Minnesota, Pennsylvania, New York, New Hampshire, Maine, and all of the adjacent Provinces of Canada.

*Food plants.*—Alder, willow, and *Amelanchier*.

#### ACRONYCTA FUNERALIS G. & R.

Head 3.5 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering posteriorly; skin bearing small, contiguous, rounded granules; general color black with a segmental series of conspicuous transverse, pale areas on the dorsum.

Body blackish, without secondary hairs and without markings excepting a segmental series of transverse, elevated, pale yellowish areas including setigerous tubercles I and II on the abdomen; in a similar position on the thorax and traversed by a deep groove. Spiracles black. Setigerous tubercles bearing but one black seta excepting VI with two setae on prothorax and on abdominal segments 1 to 9; setae I<sup>a</sup>, I<sup>b</sup> and II<sup>b</sup> on thorax and II on all abdominal segments but 7, very long, strongly flattened and broadened from near the base. Head black with large, elongate granules, without markings.

Described from two larvae collected in western Washington early in September by W. W. Baker; one inflated larva collected at Arlington, N. J., August 25, by Chas. Rummel; and two inflated larvae from the Brooklyn Museum without data.

*Distribution.*—United States: New Hampshire, New York, Connecticut, New Jersey, Missouri, and Washington. Canada: British Columbia.

*Food plants.*—Thimbleberry (*Rubus parviflorus*), ocean spray (*Holodiscus*), and reported from hickory, birch, elm, and apple.

#### ACRONYCTA AFFLICTA Grt.

Head 4.7 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, tapering posteriorly; skin bearing small spinules; general color reddish brown.

A strong, sharply defined, dusky purplish middorsal line and a reddish longitudinal stripe approximately midway between setigerous tubercles II and III. No other markings. Spiracles dark with the extreme center white. Setigerous tubercle II on some abdominal segments bearing a long black seta which is flattened and broadened toward the tip. Head strongly, coarsely granulose, brown, reticulate with purplish.

Described from one inflated larva from U. S. National Museum labeled "389L—119L, on oak, Oct. 18, 1875, coll. C. V. Riley."

*Distribution.*—Texas, Florida, North Carolina, Virginia, Missouri, Illinois, Ohio, Pennsylvania, Maryland, New Jersey, New York, Massachusetts, and Maine.

*Food plant.*—Oak.

#### ACRONYCTA HAESITATA (Grt.)

Head 3.9 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, tapering posteriorly; skin bearing minute spinules; general color apparently reddish.

Body apparently reddish and without definite markings other than a pale middorsal line margined by dark lines. Spiracles black. Setigerous tubercles paler than ground color of body. Cervical shield reddish, the setae in distinct pale spots. Head very obscurely granulose, pale, sparsely reticulate with reddish.

Described from one inflated larva from U. S. National Museum labeled "No. 756, coll. H. G. Dyar."

*Distribution.*—Texas, Florida, Georgia, North Carolina, Tennessee, Illinois, Maryland, Pennsylvania, Massachusetts, New York, New Hampshire, and Maine.

*Food plants.*—Unknown.

#### ACRONYCTA INCRETA Morr. (?)

Head 3.7 mm. broad. Body about 30 mm. long and 4.3 mm. broad at middle, tapering posteriorly; skin bearing minute spinules; general color brown with conspicuous white dorsal spots.

A broken middorsal white line margined by obscure dark brown lines which form a dark brown stripe on abdominal segments 8 and 9. An obscure pale longitudinal stripe between setigerous tubercles II and III. A segmental series of large, rounded, white spots including I from mesothorax to 8 except on 7; the spots of each side almost meeting middorsally on anterior abdominal segments. Tubercle II may be in the ventral end of an oblique white line or the white line may be absent. Tubercles I and II white not encircled with red. Spiracles black or white tinged with black at their margin. Cervical shield unicolorous brown. Head closely, coarsely granulose, pale, obscurely reticulate with brown which is not intensified in the area occupied by seta P<sup>1</sup> and P<sup>2</sup>.

Described from three inflated larvae from the Brooklyn Museum sent as *incretata* without further data.

*Distribution*.—New Mexico, Texas, Georgia, Tennessee, New Jersey, Pennsylvania, and New York.

*Food plants*.—Unknown.

#### ACRONYCTA MODICA Wlk. (?)

Head 4 mm. broad. Body about 25 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin bearing minute spinules; general color of dorsum reddish brown with large yellowish spots.

Broken pale lines middorsally, ventrad of setigerous tubercle II and dorsad of III. Tubercles I and II in large yellowish spots outlined and separated by reddish brown which is darker middorsally, forming a blackish stripe on abdominal segment 9; I and II yellowish or white narrowly margined with red. Cervical shield reddish medially with a darker lateral margin bordered dorsally by a yellowish area. Head obscurely, coarsely granulose, pale brown, with dark reticulation intensified to black in an area including setae P<sup>1</sup> and P<sup>2</sup>.

This species differs from *haesitata*, *incretata* (?), *ovata*, *hamamelis*, and *marmorata*, and does not agree entirely with Dyar's description of *modica* (39) except in the unusual coloration of the head, the discrepancies possibly being due to the immaturity of his specimens (head 3.3 mm. broad).

Described from one inflated larva received, without data, from the Brooklyn Museum.

*Distribution*.—Texas, Minnesota, North Carolina, Maryland, Pennsylvania, New York, and Massachusetts.

*Food plant*.—Oak.

#### ACRONYCTA MARMORATA Sm.

Head 4.4 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering posteriorly; skin bearing minute, slender spinules; general color pale brown.

A dark, narrow middorsal line. Setigerous tubercles I and II in a common oblique dull yellow spot on each segment from mesothorax to abdominal segment 6 and on 8. An obscure brown line ventrad of II, margined irregularly with dull yellow and a dull yellow line ventrad of the spiracles. Spiracles white. Venter pale brown. Head very coarsely granulose, pale brownish, with faint plumbeous reticulation anteriorly.

Described from four larvae collected on the gravelly prairies near Parkland, Wash., from early in September to early in October. From a larva collected September 7, 1936, a moth emerged June 30, 1937, and was determined by Clarke.

*Distribution*.—United States: California, Washington, and Montana. Canada: Manitoba and British Columbia.

*Food plant*.—Oak.

## ACRONYCTA SPERATA Grt.

Head 3.4 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering posteriorly; skin bearing minute spinules; general color reddish.

Skin reddish throughout, more or less flecked with black dorsally, the flecks tending to form a dorsal stripe and another including verruca III and the spiracles. Spiracles blackish, the extreme centre white. Subventral stripe red. Dorsal verrucae distinct, elevated, bearing spreading clumps of mostly short, stiff, reddish hairs, intermingled on verrucae I, II, and III with pale feathery hairs. Head smooth, infuscated brown, the adfrontal areas yellowish, otherwise unmarked.

Described from one inflated larva from U. S. National Museum labeled "On sassafras, Falls Church, Va., Sept. 23, 1915, H. and DG. colls.," and an inflated larva, without data, received from the Brooklyn Museum.

*Distribution.*—United States: Maine, New Hampshire, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Virginia, Illinois, Missouri, Minnesota, South Dakota, Colorado, and Montana. Canada: Alberta.

*Food plants.*—Poplar, alder, and sassafras.

## ACRONYCTA IMPLETA Wlk.

Head 3.7 to 4 mm. broad. Body about 33 mm. long and 6 mm. broad at middle, tapering posteriorly; skin bearing small spinules; skin dark, bearing tufts of hair or hair pencils on metathorax and abdominal segments 1, 2, and 8.

The markings of this larva vary both in occurrence and in color. The following description is based on specimens reared in Washington State:

Body black dorsally on a dull purplish ground to and including the spiracles, the black flecks tending to be arranged in transverse lines. Purplish lines mid-dorsally and in the line of verruca II and a purplish stripe ventrad of the spiracles may be present. Spiracles white or infuscated gray. Venter dull purplish, flecked with black. Verrucae large, the setae bristly, dark, spreading, and intermingled with numerous pale feathery hairs. The feathery hairs form prominent pale tufts dorsally (I, II, and III) on the metathorax and on abdominal segments 1 and 2 except that those from verrucae I and II on abdominal segment 1 are pale brown or blackish. On abdominal segment 8 verrucae I and II bear a common black hair pencil and III a white tuft. Head smooth, black; the adfrontal areas may be pale.

Described from eight larvae from New Jersey, British Columbia, and Washington. Eggs deposited May 28, 1939, produced larvae June 17, 1939, one of which spun up for pupation August 12, 1939, and the moth emerged May 29, 1940. Moth determined by Clarke.

*Distribution.*—United States: Washington, California, Utah, Arizona, Texas, Minnesota, Mississippi, Florida, Georgia, North Carolina, Tennessee, Virginia, Maryland, New Jersey, Pennsylvania, Connecticut, Massachusetts, New York, and Maine. Canada: Quebec, Ontario, Manitoba, Alberta, and British Columbia.

*Food Plants.*—Alder, willow, poplar, and dogwood (*Cornus*).

## ACRONYCTA DISTANS (Grt.)

Head 3 to 3.4 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering posteriorly, with a slight dorsal hump on abdominal segment 8; skin bearing minute spinules; general color of skin black.

Body black throughout excepting in a segmental series of brownish spots anterior to verruca V on abdominal segments, these spots sometimes absent.

Spiracles white. Verrucae paler than the skin, distinct, elevated, the dorsal verrucae bearing spreading tufts of short stiff hairs intermingled with feathery hairs; hairs a bright brown on thorax and abdominal segments 1, 8 and 9 and yellowish intermingled with black hairs elsewhere on dorsum. Head black, slightly roughened, a pale line or spot may be present posterior to ocellus I, otherwise unmarked.

Described from five larvae collected in western Washington in July, September, and October by W. W. Baker and the writer, and one inflated larva from U. S. National Museum labeled "No. 1248, Kaslo, B. C., coll. H. G. Dyar." A larva collected September 20, 1940, produced a moth May 22, 1941, which was determined by McDunnough.

*Distribution*.—United States: Washington, Colorado, Wisconsin, Pennsylvania, New York, New Hampshire, Vermont, and Maine. Canada: Quebec, Alberta, and British Columbia.

*Food plants*.—Cultivated raspberry, thimbleberry (*Rubus parviflorus*), apple, willow, and alder.

#### ACRONYCTA IMPRESSA Wlk.

Head 3 mm. broad. Body about 30 mm. long and 6 mm. broad at middle, tapering posteriorly; skin bearing minute spinules; general color black dorsally, brown elsewhere.

Body to midway between setigerous tubercles II and III black, elsewhere dilute brown with the white spiracles in a small black spot. Verrucae dilute brown throughout, the setae and numerous feathery hairs brown throughout but the color somewhat more intense on thorax and abdominal segments 8 and 9, no secondary hairs on body. Head black, a brown line or spot posterior to ocellus I, the adfrontal sutures and median line pale.

Described from four larvae collected at White River Camp, Mount Rainier, in Washington, September 2, 1938. Moths emerged in April and May and were determined by Clarke.

*Distribution*.—Washington, Montana, Colorado, Minnesota, Illinois, Maryland, New Jersey, Pennsylvania, New York, New Hampshire, Maine, and all of the adjacent Provinces of Canada from Nova Scotia to British Columbia.

*Food plants*.—Alder, and reported from poplar, willow, plum, hazel, currant, and blackberry.

#### ACRONYCTA PERDITA Grt.

Head 3.4 mm. broad. Body about 35 mm. long and 7 mm. broad at middle, tapering posteriorly, with a slight middorsal hump on abdominal segment 8; skin bearing pointed granules; general color black.

Body black throughout, without markings. Spiracles white or black with the extreme centre pale. Dorsal verrucae distinct, elevated, bearing spreading tufts of stiff hairs, mostly black interspersed with a few feathery hairs; I pale on abdominal segments 2 to 7, verrucae otherwise black. Head slightly roughened, black, with narrow brown submedian arcs on the occiput.

Described from one inflated larva from U. S. National Museum labeled "No. 1236, Kaslo, B. C., collection H. G. Dyar" and one larva collected on Lopez Is., San Juan County, Wash., September 13, 1947, on willow by W. W. Baker. From this last a moth emerged with abortive wings June 21, 1948.

*Distribution*.—United States: California, Idaho, Washington, and Pennsylvania. Canada: British Columbia.

*Food plant*.—Willow.

## ACRONYCTA NOCTIVACA Grt.

Head 5.3 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering posteriorly; skin bearing small spinules; general color black.

Skin black, unmarked throughout excepting an obscure reddish subventral stripe and an obscure orange or reddish spot anterior to verruca I on abdominal segment 7. Spiracles white. Dorsal verrucae large, elevated, bearing spreading clumps of black hairs interspersed with dark gray feathery hairs, especially on abdominal segments 1, 6, and 8. Head smooth, black, with a large brownish area posteriorly on occiput.

Described from one larva from U. S. National Museum labeled "B. B. 103, J. H., 1895."

*Distribution.*—United States: New York, Massachusetts, Pennsylvania, Maryland, North Carolina, Illinois, New Mexico, Colorado, and Oregon. Canada: Manitoba.

*Food plants.*—Poplar and low plants.

## ACRONYCTA BARNESI Spil. (?)

Head 3.1 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering posteriorly with abdominal segments 1 and 8 somewhat humped, dorsal setal groups stronger than elsewhere; skin set closely with granules sometimes bearing spinules; skin nearly black with a strong, sinuous, white subventral stripe.

Body deep blackish brown throughout with a segmental series of black spots middorsally between setigerous tubercles I. Spiracles black. A conspicuous white subventral stripe interrupted at V. Setigerous tubercles brownish on abdominal segments 1 to 6, dull infuscated brown or black elsewhere, their setae in spreading clumps interspersed among many shorter, slender, feathery or barbed hairs, the setae paler on VI. Head black, adfrontal sutures pale, a brown mark with P<sup>2</sup> in anterior end, and a few black freckles posteriorly on the occiput. In the penultimate instar the head, body, and setae are reddish.

Described from a larva collected on highway 410 in Washington at Pleasant Valley camp on the eastern slope of the Cascade Mountains. August 10, 1938, and another specimen taken in the same area August 24, 1941, by Wm. W. Baker from which a moth was obtained July 2, 1942. Moth No. 779, Canadian National Collection. The moth was not positively determined but the larva was not that of *perdita*.

*Distribution.*—Colorado and Washington.

*Food plants.*—Mountain-ash (*Pyrus occidentalis*) and alder.

## ACRONYCTA LONGA Grt. (?)

The specimens described probably are immature.

Head 2.8 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering posteriorly; skin bearing very small spinules; general color of skin black.

A much broken white or brown middorsal line. A series of white marks anterior to, and partially including verruca I, linear on abdominal segments 2 to 6, rounded on metathorax and abdominal segments 7 and 8. Spiracles white. A pale subventral stripe broken by a red spot including verruca V and extending dorsally posterior to the spiracles. Verrucae bearing sparse, spreading tufts of short, bristly, pale hairs, interspersed with barbed, feathery, white hairs, the barbed hairs sometimes prominent on dorsal verrucae. Cervical shield black. Head smooth, black, the adfrontal areas and median line pale.

Described from two inflated larvae received from the Brooklyn Museum, without data, through the kindness of Geo. P. Engelhardt. Determined from Dyar's Key (39).

*Distribution*.—Texas, Florida, Georgia, North Carolina, Maryland, New Jersey, Pennsylvania, Illinois, Connecticut, Massachusetts, New York, Maine, and Minnesota.

*Food plants*.—Willow, rose, oak, and blackberry.

#### ACRONYCTA OBLINITA A. & S.

Head 3.2 to 3.5 mm. broad. Body about 32 mm. long and 6 mm. broad at middle, tapering posteriorly; skin bearing short spinules; general color black with distinct paler markings.

Body black with prominent markings varying in color from white through yellow and orange to red and also in their extent. Following is a description of Washington specimens: A segmental series of white subdorsal spots at juncture of segments from mesothorax posteriorly. A conspicuous segmental series of subventral yellow spots at juncture of segments from mesothorax posteriorly tending to form a sinuous stripe. A segmental series of pinkish or orange transverse bands including the verrucae. Spiracles white. Venter black or blackish. Cervical shield concolorous with adjacent parts. Verrucae ("warts") pinkish or orange throughout, bearing rather short, spreading, yellow hairs. Head reddish brown overlaid with black to a variable degree, sometimes nearly completely black and again with black limited to the submedian arcs which, in this case, are much broadened on the occiput.

Described from a large number of larvae collected near Clarksville, Tenn., in June, July, and September and at Fairfax, Wash., August 17, 1933, by C. W. Getzendaner. Moths emerged in March (indoors?) and were determined by Dyar and by Benjamin.

*Distribution*.—United States: Washington, Texas, Florida, Georgia, North Carolina, Tennessee, Missouri, Kansas, Nebraska, Wisconsin, Illinois, Ohio, Pennsylvania, New Jersey, New York, and Massachusetts. Canada: Nova Scotia, Alberta, and British Columbia.

*Food plants*.—Cattail, Sagittaria, smartweed (*Polygonum*), fireweed (*Epilobium angustifolium*), and reported from buttonbush, willow, and alder.

#### ACRONYCTA LANCEOLARIA (Grt.)

Head 3.7 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, tapering slightly posteriorly; skin bearing small spinules; general color of skin pale greenish.

A dark middorsal stripe; a more slender, broken dark stripe between verrucae II and III and a dark stripe including the spiracles. Spiracles brown. A white or yellow subventral stripe including V. Venter dusky. Verrucae pale, strongly elevated, bearing spreading clumps of stiff hair, white basally, growing yellow apically and interspersed with black hairs. Ground color of head pale, the front black and the adfrontal areas broadly margined with black which may cover most of the head, a pale line on occiput including seta P<sup>2</sup>.

Described from one inflated larva from U. S. National Museum collected at Wakefield, Mass., July 19, 1918, on willow by Mr. Newbegin and one alcoholic larva collected at Bar Harbor, Maine., August 1, 1935, on *Spiraea latifolia* by A. E. Brower.

*Distribution*.—United States: Pennsylvania, Connecticut, Massachusetts, Maine, Colorado, and Montana. Canada: Manitoba and British Columbia.

*Food plants*.—Willow and meadowsweet (*Spiraea latifolia*).

## MEROLONCHE Grt.

## MEROLONCHE URSINA Sm.

Head 3.7 mm. broad. Body about 30 mm. long and 6 mm. broad at middle, tapering posteriorly; skin bearing minute spinules; general color black with contrasting light brown verrucae.

Skin black throughout and entirely without markings except a dingy brownish area anterior to verruca V on the abdomen. Spiracles deep infuscated brown. Verrucae a strongly contrasting light brown throughout bearing spreading clumps of short hairs intermingled with a few long slender hairs, both a mixture of black and brown. Head smooth, black except an obscure brownish line or spot posterior to ocellus I and the adfrontal areas which may be black or brown.

Described from one larva swept from herbage on the slope adjacent to Tipsoo Lake in Washington (elev. 5,300 ft.), September 27, 1937, and three larvae collected in the same area at similar elevations in August and September 1938. The larva collected in 1937 produced a moth April 14, 1938, which was determined by Clarke.

*Distribution.*—United States: Colorado, Wyoming, Utah, Washington. Canada: British Columbia and Alberta.

*Food plants.*—Herbage, including *Valerianella*, and mountain-ash (*Pyrus*).

## SIMYRA Ochs.

## SIMYRA HENRICI (Grt.)

Head 4 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering posteriorly, no humps; skin bearing small spinules; general color yellow marked with black, the orange tubercles bearing a mixture of white and black bristly hairs in a transverse orange stripe.

A black middorsal stripe between setigerous tubercle I, tending to break into reticulation posteriorly on each segment. Supraspiracular area with black reticulation. Spiracles white. Subventral stripe yellow. Venter reticulate with black. Head black, adfrontal areas and a line on occiput including seta P<sup>2</sup> white or orange, a large area below and posterior to the ocelli white with several black lines composed of fused freckles, front black.

Described from four inflated larva collected in New Jersey, September 10, by Chas. Rummel.

*Distribution.*—United States: California, Arizona, Utah, Colorado, Kansas, Montana, Minnesota, Illinois, New Jersey, Pennsylvania, New York, Massachusetts, New Hampshire, and Maine. Canada: Nova Scotia, Quebec, Manitoba, and Alberta.

*Food plants.*—Grass, smartweed (*Polygonum*), and willow.

## AGRIOPODES Hamp.

## AGRIOPODES FALLAX (H.-S.)

Head 2 mm. broad. Body about 28 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly; skin bearing setiform pubescence; general color green.

Verrucae reduced to small, flat plates (pinaculæ), each bearing several small, scattered setae; I but slightly anterior to II and approximately as close to each other as to II on abdominal segments, VI multisetiferous throughout; many secondary hairs on prolegs. Front of head, including the front, flat, vertical, forming a rounded right angle with the vertex, no secondary hairs on head.

Described from one inflated larva from U. S. National Museum labeled "On *Viburnum*, Lincolnville, Me., coll. H. G. Dyar."

*Distribution*.—United States: Kansas, Texas, Alabama, Florida, North Carolina, Tennessee, Illinois, Maryland, Pennsylvania, New York, Connecticut, Massachusetts, New Hampshire, and Maine. Canada: Nova Scotia, Quebec, and Manitoba.

*Food plant*.—Arrowwood (*Viburnum dentatum*).

### POLYGRAMMATE Hbn.

#### POLYGRAMMATE HEBRAEICUM Hbn.

Head 2.2 mm. broad. Body about 20 mm. long and 3 mm. broad at middle, tapering posteriorly; skin bearing minute granules; general color green.

With a definite segmental pattern of small brownish or reddish markings anterior and posterior to the dorsal setal groups, a yellowish white line ventrad of II, the spiracles apparently in a sinuous white stripe. Spiracles white. A segmental pattern of reddish marking on subventer to base of prolegs. Setigerous tubercle I on the abdomen flat, bearing two small setae, II a small conical tubercle with one heavier seta, III a verruca, elevated and larger than the other tubercles, bearing one large and about four small setae. Head greenish, without secondary hairs.

Described from one inflated larva from U. S. National Museum labeled "Washington, D. C."

*Distribution*.—Texas, Florida, Georgia, North Carolina, Tennessee, Kentucky, Virginia, District of Columbia, New Jersey, Pennsylvania, Connecticut, and New York.

*Food plant*.—Sour gum (*Nyssa sylvatica*.)

### HARRISIMEMNA Grt.

#### HARRISIMEMNA TRISIGNATA (Wlk.)

Head 3.4 mm. broad. Body about 30 mm. long and 5 mm. broad with prominent dorsal humps on abdominal segments 1, 2, and 3, a less prominent hump on 7 and a strong, subquadrate elevation on 8 with 9 almost vertical, all bearing setigerous tubercles I and II at apex; skin bearing slender spinules; thorax brown, abdomen black with white markings.

A middorsal pale line, a pale line somewhat nearer to II than to III and a white subventral stripe extending upon the prolegs as alternating black and white stripes and lines. Dorsum of abdominal segments 3 and 4 somewhat marked with whitish, 5 and 6 almost entirely whitish. Venter, prolegs and bases of legs blackish. Spiracles black. Cervical shield infuscated brown. Setigerous tubercles large, elevated, black throughout except dorsally on 4, 5, and 6. Head smooth excepting coarse granules posterior to the ocelli, deep brown reticulate with black, adfrontal sutures in a white stripe.

Described from one inflated larva collected at Hillside, N. J., September 15, by Chas. Rummel and one inflated larva received from U. S. National Museum without data.

*Distribution*.—United States: Texas, Mississippi, Tennessee, Missouri, Illinois, Wisconsin, Minnesota, Maryland, New Jersey, Pennsylvania, Connecticut, Massachusetts, New York, and Maine. Canada: Nova Scotia.

*Food plants*.—Winterberry (*Ilex*) lilac, ash, willow, apple, and persimmon.

## Subfamily HELIOTHINAE

Two sections of this subfamily are separable on fairly good grounds but characters for distinguishing genera within these sections are either weak or apparently absent. No attempt is made to characterize genera in the following key, which includes *Rhodoecia aurantiago* and *Pyrrhia umbra*, both of which are entirely normal heliothids.

1. Height of prothoracic spiracle, at most, but slightly less than height of spiracle on abdominal segment 8 (23:25), their heights usually equal. Crochets on prolegs uniorbinal except in *Schinia gloriosa*..... 2
- Height of prothoracic spiracle decidedly less than height of spiracle on 8 (20:25). Crochets biorbinal except in *Dasympodaea lucens*..... 14
2. Basal width of front much greater than the height (70:57). Length of epipharynx much more than one-half the height of the front (38:57). Frontal punctures on or above the line of the frontal setae..... 3
- Basal width of front, at most, but slightly greater than the height, usually less. Length of epipharynx equal to approximately one-half height of front or less..... 5
3. Cervical shield without spinules. Crochets biorbinal..... *Schinia gloriosa*
- Cervical shield bearing spinules similar to those on the skin. Crochets uniorbinal..... 4
4. Dorsal setigerous tubercles small, the transverse width of I on abdominal segment 1 equal to approximately one-fourth the space between setigerous tubercles I (13:50). Second segment of antenna brown. *Schinia trifascia*
- Dorsal setigerous tubercles large, conspicuous, the transverse width of I on abdominal segment 1 greater than the space between setigerous tubercles I (40:30). Second segment of antenna black..... *Schinia gracilentia*
5. Head with close, dark reticulation. Frontal punctures usually on or above the line of the frontal setae. Length of median line of head much greater than height of front (106:86)..... 6
- Reticulation of head sparse or absent. Frontal punctures well below the line of the frontal setae. Length of median line of head, at most, but slightly greater than height of front except in *Helioionche indiana* (40:34)..... 7
6. Body having a striped appearance owing to definite, broken lines of the ground color in the dark dorsal coloration. Dorsal setae tapering to a blunt tip..... *Schinia marginata*
- Dark dorsal coloration uniform owing to absence of lines of the ground color except traces of the middorsal line. Dorsal setae tapering to an acute point..... *Schinia thoreaus*
7. With black markings on head..... 8
- Without black markings on head..... 11
8. Black markings on head in the form of freckles. Spinules on skin short..... 10
- Black markings on head not in the form of freckles. Spinules on skin long, hairlike..... 9
9. A broad black spot on each side of head dorsally..... *Schinia brevis*
- With slender black submedian arcs on head dorsally..... *Schinia arcigera*
10. Subventral stripe including the spiracles, unicolorous white throughout..... *Melicieptria villosa*
- Subventral stripe including the spiracles, darker in dorsal half, pale ventrally..... *Melicieptria subatra*
11. Granules on skin very coarse and not bearing spinules dorsally except on some granules near juncture of segments..... 12
- Skin granules small, inconspicuous, bearing distinct spinules throughout. Markings longitudinal..... 13
12. With a segmental series of transverse dark figures on the dorsum. Spiracles pale brown and in the pale subventral coloration..... *Schinia nundina*
- With longitudinal dark stripes. Spiracles entirely black and in the black stripe including setigerous tubercle III..... *Schinia mortua*
13. Height of front less than length of median line (35:40). Setae P<sup>1</sup> on head at least as far apart as setae P<sup>2</sup>..... *Helioionche indiana*
- Height of front greater than length of median line (40:33). Setae P<sup>1</sup> distinctly closer together than setae P<sup>2</sup> (32:30)..... *Schinia obscurata*

14. Setigerous tubercle III on the abdomen minute, not elevated..... 15  
 Setigerous tubercle III on the abdomen large, at least somewhat elevated,  
 often conical..... 18
15. Length of median line of head equal to but one-half height of front (25:55).  
 Cervical shield bearing spinules similar to those on the skin. Head  
 black..... *Rhodoccia v. rantiago*  
 Length of median line of head equal to decidedly more than one-half height  
 of front (on the order of 40:60). Cervical shield without spinules.  
 Head not black..... 16
16. Crochets on prolegs unioordinal. Dorsum with numerous longitudinal dark  
 lines..... *Dasypoudaea lucena*  
 Crochets biordinal..... 17
17. Dorsum green, without black markings..... *Rhodophora florida*  
 Dorsum apparently white, with conspicuous, transverse black stripes  
*Rhodophora gaurae*
18. Setigerous tubercles I and II on abdominal segment 8 conical, bearing slender,  
 hairlike spinules. Mandible normally with a large basal process on oral  
 face bearing a narrow apical molar area, but this process sometimes absent  
 (pl. 5, G)..... *Heliothis virescens*
19. Setigerous tubercles I and II on abdominal segment 8 unarmed or with  
 minute, short spinules..... 19
20. Setigerous tubercles I and II but slightly elevated, broadly conical through-  
 out, usually bearing minute short spinules on abdominal segment 8. Mandi-  
 ble usually with a large basal process bearing a narrow apical molar  
 area..... *Pyrrhia umbra*
- Setigerous tubercles I and II without spinules on abdominal segment 8 except  
 occasionally in *phloxiphaga* in which these tubercles are strongly conical.  
 Mandible without a basal process on oral face but usually with a produced  
 margin along the second ventral rib..... 20
20. Setigerous tubercles I and II not conical but broadly convex throughout. Line  
 of setae P<sup>1</sup> somewhat above apex of adfrontal areas. Head marked with  
 black..... *Canthylidia scutoa*
- Setigerous tubercles I and II conical, particularly on abdominal segments 1, 2,  
 and 8. Line of setae P<sup>2</sup> well below apex of adfrontal areas..... 21
21. Setigerous tubercles I and II strongly conical and strongly elevated through-  
 out. Head usually marked with black..... *Heliothis phloxiphaga*
- Setigerous tubercles I and II broadly conical, somewhat more elevated on  
 abdominal segments 1, 2, and 8. Head rarely marked with black.  
*Heliothis zea* (Boddie)

## SCHINIA GLORIOSA (Stkr.)

Head 2.7 mm. broad. Body about 20 mm. long and 3.5 mm. broad at middle, tapering strongly posteriorly; skin bearing long setiform spinules arising from enlarged bases and interspersed among small rounded granules; general color apparently obscure brown tinged with pink.

An obscure, dark middorsal stripe and an indefinite pale stripe including the spiracles. No other body markings. Spiracles pale brown. Setigerous tubercles dark, moderately large but inconspicuous. Cervical shield large, sharply defined, infuscated brown, without spinules. Anal shield yellowish brown, bearing spinules like those on the skin. Crochets on prolegs rather obscurely biordinal. Legs yellow. Head yellow with sparse, inconspicuous dark reticulation.

Described from eight alcoholic larvae collected near Chicago, Ill., and Elgin, Ill., in September and October on *Liatris scariosa* and *L. cylindracea* by A. K. Wyatt.

*Distribution.*—Colorado, Nebraska, Kansas, Texas, Iowa, Illinois, and North Carolina.

*Food plants.*—*Liatris scariosa* and *L. cylindracea*.

## SCHINIA TRIFASCIA Hbn.

Head 2 mm. broad. Body about 15 mm. long and 3 mm. broad at middle, tapering posteriorly; skin bearing isolated, slender pale spinules arising from an

enlarged base and interspersed among coarse, rounded granules; general color gray with pale longitudinal stripes.

A narrow dark middorsal stripe including an obscure pale line. Setigerous tubercles I and II well within a pale stripe. A dark stripe in the supraspiracular area extending to IV and including a pale line dorsad of III. Spiracles brown, in the subventral pale stripe which extends to V and is margined ventrally by a dark stripe fading out ventrally. Setigerous tubercles large, black, the dorsal roundly elevated. Head brown tinged with pink, with dark submedian arcs and reticulation posteriorly.

Described from three alcoholic larvae collected near Chicago, Ill., and Elgin, Ill., in September and October by A. K. Wyatt.

*Distribution.*—Colorado, Nebraska, Texas, Minnesota, Iowa, Illinois, Missouri, Arkansas, Florida, Georgia, South Carolina, North Carolina, Tennessee, Pennsylvania, and New York.

*Food Plants.*—*Eupatorium sessilifolium* and *Kuhnia eupatorioides* (teste Wyatt).

#### SCHINIA GRACILENTA Hbn.

Head 2.5 to 2.7 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering posteriorly; skin granules small, each bearing a long, slender, upright hairlike spinule; general color white with prominent flat, black setigerous tubercles.

Middorsal black stripe broken or narrowed to form two spots on each segment. An irregular black stripe including setigerous tubercle III. Spiracles black, in the pale ventral coloration. Setigerous tubercles large, conspicuous black, entirely flat. Cervical shield bearing spinules. Head brown with a broad black area including  $A^2$ ,  $L^1$ ,  $P^1$ , and  $P^2$  and another in the curve of the ocelli.

Described from seven alcoholic larvae collected at Elgin, Ill., from late September to early October on *Kuhnia eupatorioides* by A. K. Wyatt.

*Distribution.*—Arizona, New Mexico, Colorado, Kansas, Texas, Illinois, and North Carolina.

*Food plant.*—False boneset (*Kuhnia eupatorioides*) (teste Wyatt).

#### SCHINIA MARGINATA Haw.

Head 2.8 to 3 mm. broad. Body about 25 mm. long and 3.5 mm. broad at middle, tapering strongly posteriorly; skin bearing coarse granules produced to form short retrorse points, interspersed among smaller granules; general color varying from almost black through brown and gray to green.

Dark dorsal coloration having a striped appearance owing to the presence of definite, but broken, pale longitudinal lines, particularly near anterior margin of segments, the most distinct of these lines being ventrad of setigerous tubercle II. Coarse granules of skin sometimes pale but usually not in pale dots. Spiracles white with brown rim, in the pale subventral stripe ventrad of which the body is of dilute dorsal coloration to base of prolegs. Setigerous tubercles moderately large, elevated, their setae white and tapering to a blunt tip. Cervical shield with 3 pale lines, the intervening dark coloration including pale dots. Head green, the dark reticulation often extending to lateral margin but absent anteriorly.

Described from numerous larvae collected about Clarksville, Tenn., in September and October by J. U. Gilmore, Joe Milam, and the writer. Moths emerged in August and September of the following year and were determined by Dyar.

*Distribution.*—Texas, Mississippi, Georgia, Florida, Tennessee, North Carolina, Virginia, Maryland, Utah, Colorado, Nebraska, Kansas, Missouri, Illinois, Pennsylvania, Massachusetts, and New York.

*Food plant.*—Ragweed (*Ambrosia artemisiifolia*).

## SCHINIA THOREAUI G. &amp; R.

Head 3.3 to 3.4 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, tapering strongly posteriorly; skin bearing very coarse, pale, elevated granules usually produced in a minute, sharp retrose point, interspersed among much smaller granules; general color apparently gray.

Dark dorsal coloration uniform excepting in traces of the middorsal pale line and small pale dots surrounding the coarse granules. Spiracles white, in the pale subventral stripe, ventrad of which the body is of dilute dorsal coloration to base of prolegs. Setigerous tubercles moderately large, pale, somewhat elevated, the dorsal setae tapering to an acute point. Cervical shield with dark reticulation. Head apparently pale brown with dark submedian arcs and reticulation posteriorly.

Described from seven alcoholic larvae collected near Chicago, Ill., in September on *Ambrosia trifida* by A. K. Wyatt.

*Distribution*.—Montana, Minnesota, Iowa, Kansas, Texas, Illinois, Indiana, Arkansas, Tennessee, Alabama, North Carolina, Maryland, Pennsylvania, and New York.

*Food plant*.—Giant ragweed (*Ambrosia trifida*).

## SCHINIA BREVIS (Grt.)

Head 1.8 to 2 mm. broad. Body about 15 mm. long and 3 mm. broad at middle, tapering posteriorly; skin bearing slightly isolated short hairs arising from enlarged bases and interspersed among coarse, rounded granules; general color dark.

Ground color apparently pale overlaid by dark markings. A middorsal dark stripe including a median pale line. Dark lines including I and in the line of II, sometimes obsolete on posterior half of abdominal segments. From somewhat ventrad of II to slightly dorsad of the spiracles a dark stripe including a pale line dorsad of III. The spiracles and setigerous tubercle V well within a pale band margined by white lines. Spiracles black. A narrow dark stripe ventrad of the subventral pale stripe. Venter pale. Setigerous tubercles small, nearly flat. Cervical shield black with three pale lines, without hairs or granules. Head smooth, white ventrad of the ocelli, a broad dark area originating anteriorly at A<sup>2</sup> and A<sup>3</sup> including P<sup>1</sup> and P<sup>2</sup> and sometimes L<sup>1</sup>, but not encroaching upon the adrontal areas or the median line.

Described from five larvae collected at Rye, N. Y., October 2, 1929, and October 19, 1929, on flowers of *Aster laevis* by Henry Bird.

*Distribution*.—Massachusetts, New York, New Jersey, North Carolina, Florida, Alabama, Illinois, Iowa, Missouri, Kansas, Nebraska, Colorado, New Mexico, and Arizona.

*Food plants*.—Flowers of species of aster (teste Bird).

## SCHINIA ARCICERA Gd.

Head 2 mm. broad. Body about 20 mm. long and 2.5 mm. broad at middle, tapering posteriorly; skin with small granules interspersed among coarser granules bearing rather long, slender hairlike spinules; general color a dusky brownish gray.

Dorsum to setigerous tubercle II slightly paler than the supraspiracular area. A middorsal dark stripe not extending to I. Pale lines ventrad of II and dorsad of III. Spiracles black, in the dorsal margin of the conspicuous pale subventral stripe, which is tinged with brownish medially. Subventer to base of prolegs dark. Venter whitish. Setigerous tubercles rather large, black. Cervical shield black with 3 pale lines. Head brown with distinct black submedian arcs and black or reddish reticulation.

Described from 13 larvae collected about Clarksville, Tenn., in October and November on aster by J. U. Gilmore, Joe Milam, and the

writer. Moths emerged in August of the following year and were determined by McDunnough and by Benjamin.

*Distribution.*—Montana, Utah, Arizona, Nebraska, Kansas, Texas, Minnesota, Michigan, Iowa, Illinois, Tennessee, Maine, New Hampshire, New York, Connecticut, New Jersey, Pennsylvania, North Carolina, and Florida.

*Food plants.*—Various species of aster.

### MELICLEPTRIA Hbn.

#### MELICLEPTRIA VILLOSA Grt.

Head 1.6 to 1.7 mm. broad. Body about 20 mm. long and 3 mm. broad at middle, tapering posteriorly; skin bearing small spinules; general color yellowish white with a black middorsal stripe.

A strong black middorsal stripe margined by prominent white or yellowish lines. Setigerous tubercles I and II included in a blackish stripe margined ventrally by a pale or yellowish line. Supraspiracular area, including IV but not including the spiracles, dusky with an irregular, obscure, pale line dorsad of III. Spiracles black, included in the broad, white subventral stripe. Venter dusky to base of prolegs, whitish midventrally. Setigerous tubercles small but not mere setal insertions. Cervical shield pale brown. Head brownish with black freckles.

Described from many larvae collected near the summit of Chinook Pass (Tipsoo Lake) in Washington from late August to early October. Moths emerged at Puyallup, Wash., from late May through June of the following year and were determined by Clarke.

*Distribution.*—United States: Colorado, New Mexico, Arizona, California, and Washington. Canada: Alberta.

*Food plant.*—*Eucephalus ledophyllus*, an asterlike plant.

#### MELICLEPTRIA SUBATRA Sm.

Head 1.7 mm. broad. Body about 14 mm. long and 2.6 mm. broad at middle, tapering posteriorly; skin bearing strong, isolated spine-like granules interspersed among small, isolated, rounded granules; general color of dorsum light gray with a black middorsal stripe.

A black middorsal stripe not including a middorsal pale line; dark lines including setigerous tubercles I and II with the area between them darker than adjacent parts; remainder of dorsum to midway between II and III pale. A dark stripe including III well within it and extending to but not including the spiracles. Spiracles black included in the pale subventral stripe which is darker dorsally and includes V in the ventral margin. Venter dusky, unmarked. Setigerous tubercles of moderate size, dark, slightly elevated. Cervical shield black with three pale lines. Head pale with blackish freckles.

Described from two larvae collected at Mystic Lake, Wash. (elev. 5,300 ft.), October 2, 1932, on aster by C. W. Getzendaner. A moth emerged indoors January 18, 1933, and was determined by Benjamin.

*Distribution.* Washington, Montana, and Wyoming.

*Food plant.*—Aster.

### SCHINIA NUNDINA (Drury)

Head 2 mm. broad. Body about 20 mm. long and 3.5 mm. broad at middle, tapering posteriorly; skin bearing very coarse, isolated, roundly elevated granules without spinules on dorsum except small retrorse points near margins of segments; general color pale or yellowish with conspicuous, transverse, black markings dorsally.

A segmental series of transverse dark markings narrow dorsally, somewhat oblique, and broadened ventrally to include setigerous tubercles III and IV,

present from mesothorax to abdominal segment 8 and broken by longitudinal pale lines. Middorsal dark stripe indicated at anterior margin of segments only. Spiracles pale brown included in the pale or yellowish subventral stripe which extends to V. Venter yellowish with a white line along base of prolegs. Setigerous tubercles large, flat, black. Cervical shield yellow with black anterior and lateral margins. Head smooth, yellowish brown, unmarked.

Described from one alcoholic larva collected at Rye, N. Y., October 1, 1929, on flowers of *Solidago* by Henry Bird, and one alcoholic larva collected at Clarksville, Tenn., October 6, 1931, on aster by J. U. Gilmore.

*Distribution.*—Kansas, Minnesota, Missouri, Florida, Georgia, Tennessee, North Carolina, Pennsylvania, New Jersey, Connecticut, Massachusetts, New York, and Maine.

*Food plants.*—Flowers of goldenrod (*Solidago*) and aster.

#### SCHINIA MORTUA (Grt.)

Head 3 mm. broad. Body about 30 mm. long and 5.5 mm. broad at middle, tapering distinctly posteriorly; skin with very coarse rounded granules which do not bear spinules on the dorsum except near juncture of segments; general color apparently pale with black longitudinal stripes.

A middorsal black stripe, continuous except on prothorax. A black stripe including setigerous tubercles I and II, the color more intense near anterior margin of segments. A broad pale stripe occupying the longitudinal area between II and III and including a subdued dark median stripe. A black stripe including III and the spiracles. Spiracles entirely black. A broad, pale subventral stripe with V in ventral margin. Venter apparently dusky. Setigerous tubercles black and very small, the transverse width of II on abdominal segment 1 equal to about one-fourteenth the space between tubercles I (4:56). Cervical shield black with 3 conspicuous pale lines, without spinules. Head smooth, brown, apparently unmarked but possibly freckled with darker brown.

Described from one inflated larva in U. S. National Museum labeled "Mexia, Tex., Sept. 13, 1905, Hunter No. 1014. Associated with adult."

*Distribution.*—Minnesota, Arkansas, Texas, Kansas, Nebraska, Wyoming, Colorado, New Mexico, and California.

*Food plants.*—In the collection of the U. S. National Museum is a moth labeled "Mexia, Tex., Bred from *Sideranthe rubiginosa* head" and another labeled "Clarendon, Tex., Bred from *Grindelia squarrosa* head."

#### HELIOLONCHE Grt.

##### HELIOLONCHE INDIANA Sm.

Head 1.3 mm. broad. Body about 15 mm. long and 2.5 mm. broad at middle, tapering strongly posteriorly; skin bearing small spinules with enlarged bases interspersed among smaller rounded granules; general color apparently green.

An infuscated brown middorsal stripe including setigerous tubercle I and a subdued middorsal pale line. Setigerous tubercle II in a pale line. Supraspiracular area to but not including the spiracles blackish, darker in dorsal half and including two pale lines. Spiracles large, nearly round, pale or pale brown with brown rim; well within the pale subventral stripe which is margined dorsally and ventrally by white lines. Venter unmarked. Setigerous tubercles minute. Head pale brownish, unmarked.

Described from nine alcoholic larvae collected at Hessville, Ind., from early in July to the middle of August on *Phlox pilosa* by A. K. Wyatt.

*Distribution.*—Nebraska, Illinois, and Indiana.

*Food plant.*—*Phlox pilosa*.

## SCHINIA OBSCURATA Stkr.

Head 1.7 mm. broad. Body about 20 mm. long and 2 mm. broad at middle, tapering posteriorly; skin with rather small coarser granules bearing small short spinules and interspersed among smaller granules; general coloration including a pale dorsum and a broad black stripe dorsad of the spiracles.

Dorsum pale to well ventrad of setigerous tubercle II, including a dark mid-dorsal stripe, a dark line in the line of I and a dark line immediately ventrad of II. A black stripe dorsad of the spiracles with III in ventral half and including a median pale line. Spiracles pale brown, in the pale ventral coloration. Setigerous tubercles minute throughout. Cervical shield pale brown, lateral margin and two large, diffuse spots posteriorly, obscurely dark. Head pale brown, unmarked.

Described from eight alcoholic larvae collected at Hessville, Ind., in July and August on fleabane, by A. K. Wyatt.

*Distribution.*—Missouri, Illinois, Indiana, Maryland, Pennsylvania, and New York.

*Food plant.*—Fleabane (*Erigeron pennsylvanicum*).

## RHODOECIA Hamp.

## RHODOECIA AURANTIACO (Gn.)

Head 2.1 mm. broad. Body about 30 mm. long and 6 mm. broad at middle, tapering posteriorly; skin set closely with short, slender spinules arising from an enlarged base and interspersed among rounded granules; general color apparently dark brownish tinged with pink.

Dorsum to and including the spiracles dark, without markings. Spiracles black. A pale subventral stripe extending to but not including setigerous tubercle V. Venter dusky throughout. Setigerous tubercles rather small, flat, black; their setae tapering to a blunt tip. Cervical shield brown or black with a slender middorsal pale line only, bearing spinules like those on the skin. Shields of prolegs brown, crochets biordinal. Head black; the adfrontal areas, median line, front, and a mark posterior to the ocelli, brown.

Described from four alcoholic larvae collected at Waukegan, Ill., September 6, 1934, on *Gerardia*, by A. K. Wyatt.

*Distribution.*—Texas, Missouri, Illinois, Wisconsin, Ohio, North Carolina, Maryland, New Jersey, Massachusetts, and New York.

*Food plants.*—*Gerardia grandiflora* and *G. pedicularia* (Wyatt).

## DASYSPOUDEA

## DASYSPOUDEA LUCENS (Morr.)

Head 2.1 mm. broad. Body about 26 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin bearing minute, short, retrorse spinules arising from a large base and interspersed among rounded granules; general color apparently gray tinged with pink, the arrangement of lines giving a striped appearance.

A dark middorsal stripe including an obscure median pale line. Dark longitudinal lines through I and II, strongest at anterior margin of abdominal segments. Supraspiracular area margined dorsally by a pale line, including pale lines dorsad of III and dorsad of the spiracles and extending to ventrad of the spiracles. A large unmarked area on anterior margin of abdominal segments including the spiracle and extending to dorsad of III. Spiracles black. A narrow, pale subventral stripe including V. Venter dusky. Setigerous tubercles small, flat, black. Cervical shield brownish with 3 pale lines. Head pale or pale brown, unmarked.

Described from three alcoholic larvae collected at Elgin, Ill., August 17, 1936, by A. K. Wyatt.

*Distribution.*—Texas, New Mexico, Arizona, Colorado, Kansas, Nebraska, Montana, Minnesota, Illinois, and North Carolina.

*Food plant.*—Lead plant (*Amorpha canescens*) (teste Wyatt).

## RHODOPHORA Gn.

## RHODOPHORA FLORIDA Gn.

Head 2.4 to 2.7 mm. broad. Body about 25 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin bearing somewhat isolated, coarse, thorn-like, slightly retrorse spinules interspersed among isolated coarse granules; general color green more or less suffused with pink.

Body apparently of much the same color throughout, excepting a pale subventral stripe, and without markings. Spiracles pale brown with brown rims. Setigerous tubercles minute, very little more than setal insertions, their setae tapering to a narrow but blunt tip. Cervical shield apparently pink. Crochets or prolegs biordinal. Head apparently pale brown or yellow and unmarked.

Described from two alcoholic larvae collected near Chicago, Ill., August 28, 1933, on *Gaura biennis*, by A. K. Wyatt, and four alcoholic specimens from the Maine Agricultural Experiment Station labeled "Lot 1267" and received through the kindness of J. H. Hawkins.

*Distribution*.—United States: Arizona, Utah, Nevada, California, Montana, Tennessee, North Carolina, Illinois, Indiana, Pennsylvania, Massachusetts, New Hampshire, New York, Maine, Michigan, and Minnesota. Canada: Quebec, Manitoba, and Alberta.

*Food plants*.—*Gaura biennis* and evening-primrose (*Oenothera biennis*).

## RHODOPHORA CAURAE A. &amp; S.

Head 2.6 mm. broad. Body about 26 mm. long and 4 mm. broad at middle, tapering posteriorly; skin bearing coarse granules, some produced to form a minute retrorse point, the usual finer granules fused to form a rough surface; general color probably white with very conspicuous transverse black stripes.

A shorter, narrow black stripe at juncture of segments and another including setigerous tubercles I and II and the spiracles and extending to well ventrad of V. Spiracles black. Setigerous tubercles small, flat. Shields of prolegs black, crochets biordinal. Head brown, unmarked.

Described from two alcoholic larvae collected near Chicago, Ill., August 28, 1933, on *Gaura biennis*, by A. K. Wyatt.

*Distribution*.—Montana, Utah, Colorado, Arizona, Kansas, Nebraska, Texas, Illinois, Mississippi, Georgia, and Florida.

*Food plant*.—*Gaura biennis*.

## HELIOTHIS VIRESCENS (F.)

Head 2.6 to 3 mm. broad. Body about 28 mm. long and 4 mm. broad at middle tapering posteriorly; skin bearing coarse granules produced as short spinules and interspersed among much finer granules; general color usually green but varying to reddish and maroon.

Body usually green with more or less dark markings margining the middorsal pale line and in the supraspiracular area and with numerous obscure, broken, pale longitudinal lines. Supraspiracular area often scarcely differentiated in color from the dorsum but sometimes more or less intensely blackish especially in the dorsal half. Spiracles black with brown centres, in the subventral pale stripe. Setigerous tubercles large, somewhat conical, somewhat more elevated on abdominal segments 1, 2, and 8. I and II bearing slender, hairlike spinules especially on 8. Head of general color, sometimes flecked with brown and occasionally reticulate with white, without dark markings.

Described from many larvae collected in Florida and Tennessee from June to October by F. S. Chamberlin and the writer. Moths determined by Dyar.

*Distribution*.—California, Arizona, Texas, Louisiana, Georgia, Florida, North Carolina, Tennessee, Virginia, Maryland, Colorado,

Kansas, Nebraska, Illinois, Ohio, Pennsylvania, Connecticut, and New York.

*Food plants.*—A rather general feeder, best known for its work on the buds, leaves, and seed capsules of tobacco. Apparently this species never attacks corn.

### PYRRHIA Hbn.

#### PYRRHIA UMBRA (Hufn.)

Head 2.7 to 2.8 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering slightly posteriorly; skin bearing short retrorse spinules arising from an enlarged base, the intervening space obscurely roughened; general color varying from white with orange markings through specimens overlaid with black in varying degrees, with or without orange markings, to larvae green throughout.

The setigerous tubercles pale or black, broadly subconical, but little elevated even on abdominal segment 8 on which segment I and II usually bear short spinules. Mandible usually with a large basal process bearing a narrow apical molar area. The white larva may have a segmental series of middorsal orange spots and a broad subventral orange stripe. Specimens overlaid with black tend to have a middorsal black stripe including a broken, pale median line; pale lines both dorsad and ventrad of II and an orange subventral stripe with the pale spiracles in a white spot at dorsal margin. The head is pale brown marked with black. The green phase is similar to the dark phase but with the subventral stripe white and the head green and without black markings.

Described from many larvae collected both east and west of the Cascade Mountains, in Washington in August. Moths emerged in May and June of the following year and were determined by Clarke.

*Distribution.*—United States: Maine, Massachusetts, New York, New Jersey, Pennsylvania, North Carolina, Tennessee, Illinois, Missouri, Kansas, Nebraska, Colorado, Michigan, Wisconsin, Minnesota, Arizona, Montana, and Washington. Canada: Nova Scotia, Ontario, Alberta, and British Columbia.

*Food plants.*—Monkshood (*Aconitum columbianum*), cabbage, mustard, rosebuds, and alder. The larva bores into the seed capsules of monkshood, as is done by species of *Heliothis* on tobacco.

### CANTHYLIDIA Butl.

#### CANTHYLIDIA SCUTOSA (Denis & Schiff.)

The specimen described is immature. Head 2.8 mm. broad. Body about 25 mm. long and 3.5 mm. broad at middle, tapering somewhat posteriorly; skin with coarse granules, each bearing a short, slender spinule, interspersed among small rounded granules; general color yellowish green.

Middorsal pale line almost obsolete, replaced by a black middorsal stripe. Black lines anterior and posterior to setigerous tubercles I and II on the abdomen. A black stripe with III in ventral margin. Spiracles black. Subventral and ventral areas apparently without dark markings. Setigerous tubercles large, conspicuous black, convex, not conical. Cervical shield irregularly marked with black. Head a bright brown with the setal insertions in small black spots and a few black freckles at posterior margin.

Described from one immature, inflated European specimen, without data. Moths are said to be present in July and August.

*Distribution.*—Montana, Utah, Colorado, Kansas, Nebraska, Minnesota, and Wisconsin. Also occurs in Europe.

*Food plant.*—J. B. Smith, in his Synopsis, states that the larva feeds on *Artemisia*.

## HELIOTHIS PHLOXIPHAGA G. &amp; R.

Head 2.6 to 2.9 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering slightly posteriorly; skin bearing coarse granules produced as short retrorse spinules and interspersed among much smaller granules; general color varying through greenish and yellow to almost black.

The details of coloration as well as the general color are quite variable. The ground color often is overlaid with black and the following details usually are present: A dark middorsal stripe including a broken, slender median pale line. A pale line dorsad of setigerous tubercle I and another ventrad of II. Spiracles pale or black, in a pale margin dorsally in the subventral stripe which extends to V. Dorsal setigerous tubercles large and strongly conical throughout, upright or inclined posteriorly and occasionally with marginal spinules on abdominal segment 8. Head pale or pale brown overlaid more or less with black markings often in the form of freckles, rarely unmarked.

Described from many larvae collected in Washington, Oregon, and Idaho from early in June to the last of September. Moths emerged from the last of June to early in September and were determined by Benjamin and by Clarke.

*Distribution.*—United States: Illinois, Minnesota, South Dakota, Nebraska, Kansas, Texas, New Mexico, Colorado, Utah, California, Oregon, Idaho, Montana, and Washington. Canada: British Columbia and Alberta.

*Food plants.*—A very general feeder. Larvae have been taken on the following plants in the field: *Aster canescens*, *Chaenactis douglasi*, tarweed (*Madia* sp.), delphinium, *Gilia aggregata*, *Lathyrus* sp., yarrow (*Achillea millefolium*), *Balsamorhiza* sp., gladiolus blossoms, strawberry, and *Grindelia* sp.

## HELIOTHIS Ochs.

## HELIOTHIS ZEA (Boddie)

## (HELIOTHIS OBSOLETA Auct.)

Head 3.3 to 3.5 mm. broad. Body about 33 mm. long and 5.5 mm. broad at middle, tapering posteriorly; skin bearing coarse granules produced as short spinules; general color varying from red, maroon, orange, yellow, and green to nearly black.

Body often green with middorsal line and supraspiracular area dark and with broken white or yellowish lines middorsally, at lateral margin of middorsal stripe, through setigerous tubercle I, between I and II, through tubercle II, ventrad of II and in the supraspiracular area. Spiracles black, pale medially, in the subventral stripe. Setigerous tubercles I and II large, broadly conical, somewhat more elevated on abdominal segments 1, 2, and 8, not bearing spinules on 8. Head of general color, often flecked with brown and sometimes reticulate with white, rarely with black markings.

Described from many larvae from various sources collected from June to October. Moths determined by Dyar and by Benjamin.

*Distribution.*—Distributed widely across the world and occurring in nearly all parts of the United States although tending to be less common in areas west of the Rocky Mountains.

*Food plants.*—A very general feeder best known for its depredations on corn and tobacco. An interesting habit has been brought to my attention by Joseph Wilcox in connection with damage to tomatoes in California, in which larvae entered the fruit in a very early instar and fed there until mature, the only evidence of their presence being a discoloration of the skin above the point of feeding.

## Subfamily ACONTIINAE

1. Oral face of mandible with a basal process bearing on apical molar area (pl. 5, A-H)-----*Acontia*  
Oral face of mandible without a basal tooth or process (pl. 5, I-N)----- 2
2. Height of prothoracic spiracle much less than height of spiracle on abdominal segment 8 (24:30)-----*Tarachidia*  
Height of prothoracic spiracle equal to that of spiracle on abdominal segment 8----- 3
3. Sieve plate of spiracle sclerotized laterally, the air passage greatly reduced (pl. 10, Q)-----*Heliocontia*  
Sieve plate of spiracle not sclerotized laterally (pl. 10, M)-----*Pseudatypia*

## ACONTIA Ochs.

- Head with full black reticulation, submedian arcs including P<sup>2</sup> black. Coloration at spiracle not as below-----*aprica*
- Head with sparse reddish or black reticulation, submedian arcs including P<sup>2</sup> yellow. Spiracles approximately at centre of large irregular spots including setigerous tubercles III, IV, and V and sharply divided in color transversely in the line of the spiracle, the anterior portion being white and the posterior portion yellow-----*delecta*

## ACONTIA APRICA (Hbn.)

Head 2 to 2.2 mm. broad. Body about 30 mm. long and 4.2 mm. broad at middle, tapering posteriorly, prolegs absent on abdominal segments 3 and 4; skin smooth; general color apparently greenish.

General coloration made up of dark, obscure lines and reticulation probably dusky greenish and tending to be darker on first four abdominal segments. An obscure, dark, middorsal stripe broken by white spots between setigerous tubercles I on anterior abdominal segments. Spiracles in a broken, sinuous, white stripe strongly margined with black both dorsally and ventrally at the spiracles on first four abdominal segments. Spiracles black. Setigerous tubercle II moderately large and somewhat elevated on 8 and 9, minute elsewhere, and usually in black spots. Cervical and anal shields black. Head white with full black reticulation, a black spot above antennal insertion, a large transverse black spot with L<sup>1</sup> in anterior margin, labrum black, and front black basally.

Described from four mature alcoholic larvae collected at Arlington, Va., August 1939 on *Althaea rosea*, by J. G. Franclemont.

*Distribution*.—Pennsylvania, Virginia, North Carolina, Tennessee, Florida, Missouri, Kansas, Nebraska, Colorado, and Texas.

*Food plant*.—*Althaea rosea* (teste Franclemont).

## ACONTIA DELECTA Wlk.

Head 2.8 mm. broad. Body about 29 mm. long and 4 mm. broad at middle, broadened on meso- and meta-thorax and abdominal segment 1, and tapering gradually posteriorly; skin smooth; general color red, spotted with yellow, black, and white.

No longitudinal lines. Setigerous tubercles in rounded black spots throughout included in or beside yellow or white spots dorsally to setigerous tubercle V. Spiracles black, at about the centre of an irregular spot including III, IV, and V, sharply divided in color transversely in the line of the spiracle, the anterior portion white, the posterior yellow. Setigerous tubercles minute except II large and gently elevated on 8. Cervical shield yellow. Head smooth, white, spotted with black, front black except at apex, occiput yellow; sparsely reticulate with reddish.

Described from one inflated larva collected by Chas. Rummel, at Arlington, N. J., August 10, and three inflated larvae in U. S. National Museum labeled "Arlington, Aug. 10" and "3197, Aug. 24, 1883."

*Distribution*.—New York, New Jersey, District of Columbia, and Virginia.

*Food plant*.—Swamp mallow (*Hibiscus moscheutos*).

### TARACHIDIA Hamp.

1. Spiracles brown. Without a lateral protuberance including the spiracle and setigerous tubercles III, IV, and V on first four abdominal segments.— *libedis*  
Spiracles white. With a lateral protuberance including the spiracle and setigerous tubercles III, IV, and V on first four abdominal segments.----- 2
2. With reddish spots dorsad of setigerous tubercle III----- *candefacta*  
With dark spots dorsad of setigerous tubercle III----- *erastrioides*

### TARACHIDIA LIBEDIS (SIN.)

Head 1.4 mm. broad. Body about 20 mm. long and 2 mm. broad, broadening gradually to abdominal segment 6, with a slight dorsal hump on 8; skin smooth; general color not determinable.

Dorsum to approximately midway between setigerous tubercles II and III occupied by five geniculate longitudinal blackish lines, partially fused in an area between I and II forming black spots particularly evident on first four abdominal segments. Remainder of body apparently pale and unmarked. Spiracles apparently brown. No protuberance including III, IV, V, and the spiracle. Setigerous tubercles rather small but not mere setal insertions. Head smooth, pale, median line margined with black; a large pale area including P<sup>1</sup> and P<sup>2</sup>; adfrontal areas, front, and a circular area including the ocelli pale; remainder of head either solid black or with black reticulation.

Described from four alcoholic larvae in U. S. National Museum labeled "Ex *Iva ambrosiaefolia*, Presidio, Tex., Oct. 3, 1944, 45-479."

*Distribution*.—Colorado, Arizona, New Mexico, and Texas.

*Food plant*.—Marsh elder (*Iva ambrosiaefolia*).

### TARACHIDIA CANDEFACATA (Hbu.)

Head 1.6 mm. broad. Body about 30 mm. long and 2.8 mm. broad, abdominal segments of about equal width, the incisures strongly constricted except on posterior segments, a rather distinct middorsal hump on 8; skin smooth; general color greenish.

Dorsum with numerous slender, longitudinal dark lines. Venter with about 7 longitudinal white lines. A large reddish spot dorsad of setigerous tubercle III and including I and II and a similar spot ventrad of the spiracles on most abdominal segments. Spiracles white, in sinuous white stripe. Head apparently pale, without submedian arcs but with strong, coarse-meshed dark reticulation.

Described from five alcoholic larvae collected near Chicago, Ill., September 24, 1939, by A. K. Wyatt on *Ambrosia elatior*.

*Distribution*.—Rather generally distributed in the United States, the records including: Maine, Massachusetts, Connecticut, New York, Pennsylvania, North Carolina, Florida, Alabama, Mississippi, Texas, Illinois, Missouri, Iowa, Minnesota, Montana, Colorado, Utah, Arizona, and California.

*Food plants*.—Species of ragweed (*Ambrosia*).

### TARACHIDIA ERASTRIOIDES (Gn.)

Head 1.6 mm. broad. Body about 23 mm. long and 2.8 mm. broad, abdominal segments of about equal width, the incisures strongly constricted anterior to 7 and a strong middorsal hump involving 7 and 8; skin smooth; general color probably greenish.

Numerous slender, longitudinal dark lines dorsally, the dorsal coloration extending to base of prolegs, and with white lines on the venter. Dark spots ventrad of the spiracles and dorsad of setigerous tubercle III, the latter sometimes extending well up on the dorsum forming shield-shaped figures on anterior abdominal segments. Spiracles white, in a sinuous white stripe. Head apparently pale, without submedian arcs but with alternating, dark brownish and pale lines medially and coarse-meshed dark reticulation laterally, a large, rounded pale area partially including the ocelli.

Described from two alcoholic larvae collected near Chicago, Ill., by A. K. Wyatt on *Ambrosia trifida*. Knutson (?9) records moths on the wing in June and July.

*Distribution*.—Massachusetts, New York, Pennsylvania, New Jersey, Maryland, Virginia, North Carolina, Tennessee, Georgia, Texas, Missouri, Illinois, Iowa, Nebraska, and Minnesota.

*Food plants*.—Species of ragweed (*Ambrosia*).

### HELIOCONTIA Hamp.

#### HELIOCONTIA MARGANA (F.)

Head 1.3 mm. broad. Body broadening gradually posteriorly with a slight middorsal hump on abdominal segment 8; skin smooth; general color not determinable.

Dorsum to midway between setigerous tubercles II and III (or reaching III on anterior abdominal segments) bearing about 15 longitudinal black lines, mostly irregular and broken, without any added segmental spots as in *Tarachidia*. Ventrals of this to V pale. Spiracles black. Markings on venter similar to those on dorsum but more obscure. An oblique black spot including V on abdominal segment 1 and ventrad of V on 2 to 4. A protuberance, more pronounced on anterior segments, including III, IV, V, and the spiracles on 1 to 4. Setigerous tubercles generally small, II larger on 7 and both I and II larger on 8. Head brown, ventral surface, adfrontal areas, an area margining them and a stripe of reticulation with A<sup>2</sup> and L<sup>1</sup> in lateral margin, black.

Described from two alcoholic larvae in U. S. National Museum labeled "Ex *Melochia carihosifolia*, Savannah, Ga., July 7, 1944, Lots 44-18245, 44-18968. Assoc. adults det. C. H."

*Distribution*.—Texas and Georgia.

*Food plant*.—*Melochia carihosifolia*.

### PSEUDALYPIA Hy. Edw.

This genus undoubtedly belongs in the Acontiinae although it has been associated with the Agaristinae for a long time.

#### PSEUDALYPIA CROTCHI Hy. Edw.

Head 2.2 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering somewhat posteriorly, the abdominal segments convex in lateral outline owing to deep segmental incisures and with a protuberance including setigerous tubercles III and IV and the spiracle more pronounced on 1 to 3; skin smooth; general color yellow with dark crenulate longitudinal lines throughout and subdorsal dark spots on 1 to 3.

A geminate dark middorsal line, the included space suffused with the same color, tending to be obliterated except near the incisures on abdominal segments 1 to 4. Broad, oblique, dark spots on 1 to 3 originating at anterior margin of segments, including setigerous tubercles I and II, terminating dorsally slightly posterior to II and not entirely obliterating the underlying dark, crenulate longitudinal lines. The dark spots bordered posteriorly by large yellow areas originating in the spiracular area, extending to posterior margin of segments in

this area and produced obliquely dorsad to meet middorsally on the following segment. Spiracles yellow with brown rim, in a sinuous yellow stripe giving off a branch extending upon the prolegs. Head yellow with sparse dark reticulation.

Described from 2 mature and 3 immature alcoholic larvae labeled "Eggs collected Lovejoy Buttes, Mojave Desert, April 12, 1943, J. A. Comstock." Comstock (10) gives a good, illustrated account of this species.

*Distribution*.—California.

*Food plants*.—*Malvastrum exile* and *M. parviflora* (teste Comstock).

### Subfamily CUCULLIINAE

(as here restricted)

The Cuculliinae, as generally considered, seems to include two series of genera not closely related and is here limited to those genera whose affinities seem to be with *Cucullia*, *Adita*, *Homoncoenemis*, *Feralia*, and *Copipanolis*. *Oxyenemis* is removed from the Amphipyriinae and placed here, while *Psaphida* and *Eutotype* are included with some hesitation since they show considerable deviation.

Since many of the species belonging to this subfamily seem to be both uncommon and difficult to rear, an unusual number of undetermined species has been included to give a better conception of the range of characters.

1. Labial palpus not more than one-half as long as the spinneret. Crochets on prolegs biordinal. Mandible with five teeth occupying the entire cutting margin. Head pavement granulate, the small granules interspersed among large flat or nearly flat granules.----- 2  
 Labial palpus usually somewhat longer than the spinneret and never much shorter except sometimes in *Feralia* (29:47) in which the crochets on prolegs are uniordinal.----- 5
2. Mandible without a basal tooth or process on oral face. Setigerous tubercle III nearer to II than to I on abdominal segment 2. Ocelli III and IV less than the width of III apart.----- 3  
 Mandible with a large basal tooth or process on oral face. Ocelli III and IV the width of III apart.----- 4
3. Third segment of labial palpus approximately one-half as long as basal segment (6:11). A long, slender, acute tooth on base of leg claw. A decided dorsal hump on abdominal segment 8. Subventral pale stripe extending down the anal proleg.----- *Oxyenemis*  
 Third segment of labial palpus minute, one-tenth as long as basal segment or less. Base of leg claw broadly rounded. No dorsal hump on abdominal segment 8. Subventral pale stripe margining the anal shield.----- *Lathosea*
4. Setigerous tubercle III nearer to II than to I on abdominal segment 2 (35:40). Skin coarsely granulate.----- Genus No. 1  
 Setigerous tubercle III farther from II than from I (37:34), on abdominal segment 2. Skin minutely granulate.----- *Cucullia*
5. Setigerous tubercle A<sup>2</sup> twice the ocellar width or more removed from ocellus II. Crochets uniordinal except in Genus No. 3 in which the mandible has a basal tooth on oral face. Ocelli III and IV usually approximately the width of III apart or more. Cutting margin of mandible usually bearing three to five teeth and a straight or crenulate dorsal margin but with eight teeth in Genera Nos. 2 and 4. Head minutely pavement granulate or smooth throughout.----- 6  
 Setigerous tubercle A<sup>2</sup> the ocellar width or less removed from ocellus II except sometimes in *Adita* in which the head is coarsely granulate medially. Crochets often rather obscurely biordinal. Ocelli III and IV approximately one-half the width of III apart or less. Mandible without a basal tooth or process on oral face and normally with 8 to 12 teeth on cutting margin but this is variable.----- 12

6. Mandible without a basal tooth or process on oral face. Feed on foliage of deciduous trees----- 7  
 Mandible with a basal tooth or process on oral face. None feed on deciduous trees except *Feralia februalis* in which there is a very pronounced hump on abdominal segment 8----- 10
7. Mandible with 8 teeth on cutting margin. Setigerous tubercles large. Skin smooth. Length of labial palpus much greater than that of the spinneret (18:12). Line of setae P<sup>1</sup> well below apex of adfrontal areas. Postero-median setae on anal shield nearly four times as far from each other as from the postero-lateral setae (18:5)----- Genus No. 2  
 Cutting margin of mandible with 3 to 5 teeth and a straight or crenulate dorsal margin. Postero-median setae on anal shield, at most, less than twice as far from each other as from the postero-lateral setae (26:15)--- 8
8. Skin distinctly pavement granulose. Setigerous tubercles large. Length of labial palpus much greater than that of the spinneret (32:22). Line of setae P<sup>1</sup> well below apex of adfrontal areas. Postero-median setae on anal shield nearly twice as far from each other as from the postero-lateral setae (26:15)----- *Copipanolis*  
 Skin smooth. Postero-median setae on anal shield not much farther from each other than from the postero-lateral setae----- 9
9. Labial palpus and spinneret subequal in length (19:20). Setigerous tubercles minute, mere setal insertions. Line of setae P<sup>1</sup> at or above apex of adfrontal areas----- *Psaphida*  
 Length of labial palpus distinctly greater than that of the spinneret (27:19). Setigerous tubercles large. Line of setae P<sup>1</sup> well below apex of adfrontal areas----- *Eutolyte*
10. Crochets on prolegs biordinal. Third segment of labial palpus minute, scarcely longer than the second segment and approximately one-ninth as long as the basal segment. Spinneret very short, no longer than basal segment of labial palpus. Feed on herbs----- Genus No. 3  
 Crochets unordinal. Third segment of labial palpus one-half as long as basal segment or more. Spinneret much longer than basal segment of labial palpus----- 11
11. Mandible normally with eight teeth on cutting margin. Height of prothoracic spiracle approximately equal to that of the spiracle on abdominal segment 8 (13:14). Feeds on herbs of the mint family  
 Genus No. 4 ("*Agriopods*" *teratophora*)  
 Mandible with 3 or 4 teeth on cutting margin. Height of prothoracic spiracle distinctly less than that of the spiracle on 8 (25:30). Feed on foliage of trees----- *Feralia*
12. Head smooth or finely pavement granulose throughout. Third segment of labial palpus twice as long as second segment. Feed exclusively on snowberry (*Symphoricarpos* spp.). Distribution limited to areas west of the Rocky Mountains----- *Pleroma*  
 Head pavement granulose laterally but bearing coarse, polished, convex granules medially. Do not feed on snowberry excepting some species of *Homohadena*----- 13
13. Third segment of labial palpus much longer than second segment (7:3). Line of setae P<sup>1</sup> at or below apex of front. Generally distributed  
*Homohadena*  
 Third segment of labial palpus minute, subequal in length to the second segment----- 14
14. Without a dorsal hump on abdominal segment 8. Crochets unordinal except in *punctilinea* in which the line of setae P<sup>1</sup> is below apex of front.  
*Oncocnemis*  
 With a dorsal hump on abdominal segment 8. Line of setae P<sup>1</sup> well above apex of front. Crochets rather obscurely biordinal----- 15
15. Length of spinneret equal to twice the median width or less. Distribution limited to areas east of the Rocky Mountains----- *Adita*  
 Length of spinneret equal to four times the median width or more. Distribution limited to areas west of the Rocky Mountains----- *Homococnemis*

## OXYCNEMIS Grt.

This genus has been transferred from the Amphipyrrinae owing to its structural similarity to the Cuculiinae as here restricted.

General color dark purplish..... *Oxycnemis fusimacula*  
 General color pale green..... *Oxycnemis* sp. (No. 1)

## OXYCNEMIS FUSIMACULA Sm.

Head 1.9 to 2 mm. broad. Body about 25 mm. long and 3 mm. broad at middle, tapering somewhat posteriorly with a rounded dorsal hump on abdominal segment 8; skin smooth; general color dark, infuscated purplish, with a prominent white subventral stripe sinuate on dorsal margin.

A middorsal purple line. A pale stripe slightly ventrad of setigerous tubercle II, so filled by a dark stripe as to appear as two pale lines. A prominent white subventral stripe, the white spiracles in dorsal margin, extending to VI, strongly sinuous dorsally, a purplish line or stripe near ventral margin. Venter blue-green, strongly suffused with purple. Base of prolegs white. Setigerous tubercles I and II moderately large, especially II on 8. Head greenish white slightly suffused with purple, with clusters of small, black freckles.

Described from 15 larvae collected on the grounds of Southwestern Arboretum near Superior, Ariz., May 11, 1938. A moth emerged June 27, 1938, and was determined by Clarke.

*Distribution.*—Arizona, Utah, Nevada, and California.

*Food plant.*—*Krameria parvifolia*.

## OXYCNEMIS sp. No. 1

Head 1.8 to 2.1 mm. broad. Body about 25 mm. long and 3 mm. broad at middle, tapering posteriorly with a rounded hump dorsally on abdominal segment 8; skin smooth; general color pale green with a whitish suffusion.

A pure white middorsal stripe. A pale stripe between setigerous tubercles II and III including a greenish line. A white stripe including the spiracles, sometimes produced to include III and margined ventrally by a purple line. Spiracles white. Venter greenish white. Setigerous tubercles small except II on 8. Head white with translucent greenish freckles.

Described from 25 larvae collected at the Southwestern Arboretum near Superior, Ariz., May 11, 1938. No moth was reared.

*Distribution.*—Arizona.

*Food plant.*—*Krameria parvifolia*.

## LATHOSEA Grt.

1. Spiracles white or yellowish..... 2  
 Spiracles black. Head with black markings. Pale longitudinal stripes more or less constricted or obscured through the intrusion of black markings... 3
2. Head unmarked excepting unpigmented freckles. Spiracles not encircled with black. Setigerous tubercles small, the transverse width of I on abdominal segment 1 much less than the space between I and II (7:30). Pale longitudinal stripes sharply defined neither constricted nor obscured through the intrusion of black markings. Ground color dark green

*Lathosea* sp. nov. (No. 2)

Head strongly marked with black. Spiracles encircled with black. Setigerous tubercles large, the transverse width of I on abdominal segment 1 much greater than the space between I and II (21:11). Pale longitudinal stripes more or less constricted or obscured through the intrusion of black markings. Ground color white.....

*Lathosea* sp. (No. 3)

3. Spiracles not encircled with black. Setigerous tubercles small, the transverse width of I on abdominal segment 1 less than space between I and II (13:19). Ground color green dorsally and ventrally. Middorsal stripe red. Head sparsely marked with black.----- *Lathosea* sp. nov. (No. 4)  
Spiracles encircled with black. Setigerous tubercles large, the transverse width of I on abdominal segment 1 much greater than the space between I and II (24:12). Ground color of dorsum white or blue gray. Head strongly marked with black.----- 4
4. Middorsal stripe dark red. Venter white.----- *Lathosea* sp. (No. 5)  
Middorsal stripe yellow or orange. Venter green.----- *Lathosea dammersi* McD.

## LATHOSEA sp. nov. (No. 2)

Head 3.1 to 3.3 mm. broad. Body about 37 mm. long and 6 mm. broad at middle, tapering posteriorly; skin both coarsely granulose and pavement granulose; general color dark green with sharply defined prominent longitudinal pale stripes.

Dark areas liturate and transversely lined with black. White stripes of nearly equal width middorsally, ventrad of setigerous tubercle II and dorsad of III, not encroached upon by black markings, the middorsal yellowish white, that dorsad of III sometimes including a series of yellow spots. Spiracles white not encircled with black. Subventral stripe yellowish white, including a series of yellow spots and margined ventrally by a black line. A broken pale stripe along base of prolegs and a white midventral stripe. Setigerous tubercles small, flat, black, the transverse width of I on abdominal segment 1 much less than the space between I and II (7:30). Head white, unmarked excepting unpigmented freckles.

Described from 20 larvae collected near Tieton, Wash., from the middle of May to the middle of June. A male moth emerged abortively but with perfect genitalia and was determined by Clarke as a new species.

*Distribution*.—Washington.

*Food plant*.—Rabbitbrush (*Chrysothamnus*).

## LATHOSEA sp. (No. 3)

Head 3 to 3.2 mm. broad. Body about 37 mm. long and 6 mm. broad at middle, tapering posteriorly; skin with obscure coarse granules and pavement granules; general color white, the longitudinal pale stripes more or less constricted or obscured through encroachment of black markings.

Dark areas liturate and transversely lined with black particularly dorsally to setigerous tubercle II. A white middorsal stripe including a broken orange stripe and constricted or broken by a pair of small black spots medially on anterior abdominal segments. A white stripe ventrad of setigerous tubercle II invaded by dark markings about midway of each segment. A white stripe dorsad of III including a broken orange stripe and more or less invaded by black markings. Spiracles pale yellowish encircled with black. A white subventral stripe including an orange spot ventrad of each spiracle and margined ventrally by a black line. Setigerous tubercles, and especially I, large, flat, black, the transverse width of I on abdominal segment 1 much greater than the space between I and II (21:11). Head white with black freckles and slender black submedian arcs anteriorly.

Described from one larva collected on Snake River opposite Clarkston, Wash., May 20, 1933, by J. F. Gates Clarke, and eight larvae collected by the writer near Tieton, Wash., during May. Attempts to secure a moth have been unsuccessful. This may be *pulla* Grt.

*Distribution*.—Washington, Idaho.

*Food plant*.—Rabbitbrush (*Chrysothamnus*).

## LATHOSEA sp. nov. (No. 4)

Head 3 to 3.2 mm. broad. Body about 35 mm. long and 6.5 mm. broad at middle, tapering posteriorly; skin obscurely roughened but scarcely granulose; ground color green overlaid with black markings, middorsal stripe red.

Darker areas liturate and transversely lined with black, the ground color green. Middorsal stripe red, constricted by a pair of oblique, linear black marks medially on anterior abdominal segments. Yellow stripes ventrad of setigerous tubercle II and dorsad of III somewhat obscured through the encroachment of black markings. Spiracles black, not encircled with black. Subventral stripe white, including a series of yellow spots. A series of white spots above the legs and prolegs, midventer closely reticulate with darker green. Setigerous tubercles small, flat, black, the transverse width of I on abdominal segment 1 less than the space between I and II (13:19). Head white, without black submedian arcs but with small, sparse black freckles.

Described from 20 larvae collected near Superior, Ariz., and about 55 miles north of Phoenix in the Seven Springs Recreation Area from the latter part of March to the latter part of April 1938. A moth emerged out of doors at Puyallup, Wash., December 28, 1938, and was determined by Clarke as a new species. The specimen (No. 592) is now in the National Museum.

*Distribution.*—Arizona.

*Food plant.*—*Gutierrezia wrightii*.

## LATHOSEA sp. (No. 5)

Head 3 to 3.2 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering posteriorly; skin both obscurely coarsely granulose and pavement granulose; ground color white heavily overlaid with black markings, middorsal stripe dark red.

Darker areas liturate and transversely lined with black, the ground color white without a trace of green. Middorsal stripe dark red, constricted or broken medially on anterior abdominal segments by a pair of small, oblique black spots. Yellow stripes ventrad of setigerous tubercle II and dorsad of III, both more or less obscured through the encroachment of black markings. Spiracles black, encircled with black. Subventral stripe white, including a series of yellow spots. Venter mostly white, reticulate with purplish at the interstices. Setigerous tubercles large, flat, black; the transverse width of I on abdominal segment 1 much greater than the space between I and II (24:12). Head bluish white with narrow black submedian arcs and strong, close black freckles.

Described from five larvae collected near Superior, Ariz., and about 55 miles north of Phoenix in the Seven Springs Recreation Area the forepart of April 1938. No moth was reared. This may be *spaldingi* B. & B.

*Distribution.*—Arizona.

*Food plants.*—Four specimens on *Gutierrezia wrightii*, one on *Chrysoma laricifolia*.

## LATHOSEA DAMMERSI McD.

The writer has seen no larvae of this species and the following is drawn from the description by Comstock and Dammers (11) and their excellent figures.

Body about 45 mm. long and 7 mm. broad at middle tapering posteriorly; ground color blue gray overlaid with black markings, middorsal stripe yellow sometimes varying to orange.

Darker areas liturate and transversely lined with black, the ground color blue gray dorsally, green ventrally. Middorsal stripe yellow constricted or broken by a pair of black marks medially on anterior abdominal segments. Yellow (or sometimes orange) stripes ventrad of setigerous tubercle II and dorsad of III obscured though the intrusion of black markings. Spiracles black, apparently encircled with black. Subventral stripe white including a series of yellow (or orange) spots. A series of white spots in the line of the legs and prolegs. Mid-venter green with black spots. Setigerous tubercles large, flat, black, the transverse width of I on abdominal segment I much greater than the space between I and II (about 24:12). Head pale blue-gray with slender black submedian arcs anteriorly and heavily marked with black.

Larvae were collected in California in February, March, and May by Comstock and Dammers, and moths are said to be on the wing in December and January.

*Distribution.*—California.

*Food plants.*—*Stenotopsis linearifolius*, *Acamptopappus schaeroccephalus*, *Ericameria palmeri*, *Ericameria pinifolia*, and *Gutierrezia sarothrae* (teste Comstock and Dammers).

#### GENUS No. 1.

1. With conspicuous pale stripes middorsally and including the spiracles  
Species No. 7  
Without pale stripes, the only markings consisting of orange spots laterally  
on the thorax and anterior abdominal segments----- Species No. 6

#### GENUS No. 1.

#### SPECIES No. 6.

Head 4 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering posteriorly; skin set closely with very coarse, often transverse, shining granules; general color black with orange spots laterally on thorax and abdominal segments 1 and 2.

Body entirely black both dorsally and ventrally excepting orange spots on thorax in the line of the spiracle and posterior to the spiracle on abdominal segments 1 and 2. Spiracles black. Setigerous tubercles small, black. Head obscurely, coarsely granulose, black with clusters of small black freckles.

Described from one larva collected on the prairie near Parkland, Wash., July 3, 1935, by S. E. Crumb, Jr. No moth was reared.

*Distribution.*—Washington.

*Food plant.*—False dandelion (*Hypochaeris radicata*).

#### GENUS No. 1.

#### SPECIES No. 7.

Head 3.4 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering distinctly posteriorly; skin set closely with coarse, slightly convex granules; general color black with conspicuous middorsal and spiracular stripes.

Body, including the legs and prolegs, intense black except as noted. A mid-dorsal stripe occupying about half of the longitudinal area between setigerous tubercles I, yellow with white margins. Including III and extending to V, a white band with the spiracles somewhat ventrad of the center and included in a narrow yellow stripe. Spiracles black. Setigerous tubercles rather large, flat, black, the setae black, short, stiff. Slender pale lines in the line of the prolegs and midventrally. Head whitish heavily overlaid with freckles and streaks of black.

Described from one larva collected in Washington on the slope adjacent to Tipsoo Lake near the summit of Chinook Pass, September 27, 1937. No moth was reared.

*Distribution.*—Washington.

*Food plant.*—*Eucephalus* sp.

### CUCULLIA Schrank

1. Spiracles entirely black. Tarsi black. Head white with broad black markings, the white ground color nearly or quite obscured in *convexipennis*..... 2  
Spiracles white, yellow, or brown. Tarsi not black. Head green or purplish with brown or black freckles which are inconspicuous except in *montanae*... 6
2. With a decided dorsal hump on abdominal segment 8. Middorsal stripe orange or red. Setigerous tubercles I and II in a broad, black longitudinal stripe including several parallel, white longitudinal lines..... *convexipennis*  
Without a dorsal hump on abdominal segment 8. Coloration in the area occupied by I and II not as above..... 3
3. Black stripe arising above base of antenna not joining the black area on posterior margin of head (pl. 8, I). Femur and tibia yellow marked with black. Prolegs entirely black. Middorsal stripe yellow, broken by several black transverse lines on each segment..... *speyeri* race *dorsalis*  
Black stripe arising above base of antenna normally joining the black area on posterior margin of head (pl. 8, H). Femur and tibia white marked with black. Prolegs partially white..... 4
4. Dorsal coloration black with a broad, continuous, orange middorsal stripe and three transverse white spots in the supraspiracular area on each abdominal segment. Of strictly eastern distribution..... *algarata*  
Dorsal coloration greenish white strongly marked with black. The pater middorsal stripe broken into isolated spots by several transverse black lines or stripes on each segment, extending to the spiracles and often connected laterally on the dorsum by an angularly sinuous black stripe (pl. 11, P).... 5
5. Broken middorsal stripe red. Middorsal pater spots approximately of the shape shown in pl. 11, Q. Subventral red stripe margined by longitudinal black lines. Head 3.4 to 3.6 mm. broad in the mature larva  
*Cucullia* sp. (No. 8)  
Broken middorsal stripe yellow or orange. Middorsal pater spots approximately of the shape shown in pl. 11, P. Subventral orange stripe without a trace of margining black longitudinal lines. Head of mature larva 3.2 to 3.3 mm. broad. Of western distribution..... *luctifera*
6. The black line in the line of the spiracles broadened to include or, at least, to narrowly encircle the spiracle on each segment. The subdorsal black line including setigerous tubercle II and that margining the middorsal white or yellow stripe tending to be broadened about midway of their length on each segment, the two lines sometimes fused thus forming a black spot or stripe..... 7  
The black line in the line of the spiracles not at all broadened at the spiracles, not enclosing or encircling them. The black subdorsal line including setigerous tubercle II and that margining the middorsal stripe not broadened midway of the segments..... 8
7. Posterior two-thirds of head marked closely with conspicuous black freckles. Of western distribution..... *montanae*  
Head with inconspicuous small, brown or black freckles. Of eastern distribution..... *asteroidea*
8. Spiracles brown. General color pale greenish yellow. The usual two black lines between those including setigerous tubercles II and III absent  
*Cucullia* sp. (No. 9).  
Spiracles white or yellow. General color green or purplish. The two black longitudinal lines present between those including setigerous tubercles II and III..... *postera* race *omissa* Dod

## CUCULLIA CONVEXIPENNIS G. &amp; R.

Head 3.9 mm. broad. Body about 45 mm. long and 7 mm. broad at middle, abdominal segments tapering slightly posteriorly with a prominent middorsal hump on 8; skin finely pavement-granulose; body prominently striped, the pattern abruptly different on 8.

An orange or red middorsal stripe margined by a broad black stripe extending to well ventrad of II and including 4 broken, white longitudinal lines. The black stripe margined ventrally by a broad yellow band extending to ventrad of the spiracles; traversed by about 4 or 5 black lines on each segment and margined ventrally by a narrow black stripe; subventral stripe narrow, red. Venter black with longitudinal white lines which are obsolescent midventrally. Setigerous tubercles minute. Head black, the adfrontal areas and spots at the ocelli white.

Described from four larvae collected in Tennessee and Kentucky in July and September. These were compared with determined specimens in the U. S. National Museum.

*Distribution.*—United States: South Carolina, North Carolina, Tennessee, Kentucky, Maryland, New Jersey, Pennsylvania, New York, Vermont, New Hampshire, and Maine. Canada: Quebec.

*Food plants.*—Goldenrod (*Solidago*) and aster.

## CUCULLIA SPEYERI Lint. race DORSALIS Sm.

Head 3.2 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, tapering somewhat posteriorly; skin pavement-granulose; general color white with a yellow middorsal stripe and transverse black markings.

Middorsal yellow stripe interrupted by 3 transverse black stripes per segment, with some variation at the extremities, the median broadest, extending to well ventrad of the spiracles although more or less broken in the supraspiracular area. Spiracles black. A sinuous yellow stripe well ventrad of the spiracles. Venter with a pattern of sparse black spots. Prolegs entirely black. Legs yellow, spotted with black; tarsi black. Setigerous tubercles minute. Head white, a broad posterior margin, a broad arc arising above the antennal insertion and extending between P<sup>1</sup> and P<sup>2</sup>, front, adfrontal areas and ventral surface black, the median dark area isolated by white both laterally and apically (pl. 8, I).

Described from one larva collected at Puyallup, Wash., July 26, 1930. The moth emerged August 3, 1931, and was determined as *speyeri* by Benjamin. Later Franclemont determined this specimen as *Cucullia speyeri* race *dorsalis* Sm.

*Distribution.*—The distribution of *dorsalis* Sm. is rather restricted including New Mexico, Colorado, Utah, Washington, and Montana, in the United States, and Saskatchewan in Canada, while typical *speyeri* occurs much more widely, the records for the United States including New Hampshire, Massachusetts, New York, New Jersey, Iowa, Nebraska, South Dakota, Colorado, Arizona, Utah, Nevada, California, and Montana; and for Canada: Alberta, Saskatchewan, and Manitoba.

*Food plant.*—Colt's tail, fleabane (*Erigeron canadensis*).

## CUCULLIA ALFARATA Stkr.

Head 3.3 mm. broad. Body about 37 mm. long and 6 mm. broad at middle, tapering somewhat posteriorly; skin bearing minute, isolated granules; body prominently striped.

A broad, continuous middorsal orange stripe ventrad of which is a broad black stripe including the spiracles, interrupted by three transverse white spots on each segment in the supraspiracular area. Spiracles black. The broad subventral stripe orange. Venter to base of prolegs white, spotted with black, midventer

pale. Setigerous tubercles minute. Legs and prolegs white spotted with black. Head black, an area margining the adfrontal areas, a large area in the ocellar region, and the labrum, white.

Described from one larva collected near Clarksville, Tenn., September 21, 1921. The moth emerged August 3, 1922, and was determined by Dyar.

*Distribution*.—Florida, North Carolina, Tennessee, Virginia, and Pennsylvania.

*Food plant*.—*Aster ericoides*.

#### CUCULLIA sp. (No. 8)

Head 3.4 to 3.6 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, tapering somewhat posteriorly; skin obscurely roughened, not granulose; general color white with red and black markings.

Body to and including the spiracles with two transverse black stripes on each abdominal segment and similarly on the thorax, the posterior stripe including the spiracle, with traces of several transverse black lines in the supraspiracular area and margined ventrally by a black line (pl. 11, Q). Middorsal red stripe reduced to two spots on each abdominal segment by the traversing black stripes, the posterior followed by a white spot, the anterior with a white area laterally forming a transverse figure, the shape of these spots much as in pl. 11, Q. These spots margined by a strong angularly-sinuuous, black longitudinal stripe including setigerous tubercles I and II. Spiracles black. A red subventral stripe with black marginal lines. Venter white with sparse black markings. Setigerous tubercles minute. Prolegs white, the shields margined narrowly with black. Legs white, the tarsi black. Head white with the median black area joining the posterior black area on the occiput (pl. 8, H).

Described from many larvae abundant in a restricted, very dry area several miles east of the Currant Flat Ranger Station on highway 410 in eastern Washington, September 28, 1937. All of the larvae collected died of a disease resembling wilt and no specimens have been seen since.

*Distribution*.—Washington.

*Food plant*.—*Aster canescens*. An aster with bluish purple blossoms, very sticky flower heads and narrow, fleshy leaves.

#### CUCULLIA LAETIFICA Linl.

Head 3.2 to 3.3 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering somewhat posteriorly; skin set closely with small, obscure granules; general color greenish white strongly marked with black.

An orange or yellow middorsal stripe broken into isolated spots by several transverse black lines or stripes on each segment extending to ventrad of the spiracles and broadened laterally on the dorsum, thus sometimes coalescing to form an angularly sinuate longitudinal stripe including setigerous tubercles I and II (pl. 11, P). Spiracles black. A strong, continuous, orange or yellow subventral stripe well ventrad of the spiracles, not margined by black longitudinal lines. Ventrad of this the dorsal pattern continues but less well developed. Setigerous tubercles minute. Prolegs black exteriorly, the shield and planta white. Femur and tibia white marked with black, tarsi black. Head white with broad black markings (pl. 8, H), the black stripe arising above antennal insertion normally narrowly joined apically to the black area at posterior margin of head.

Described from 11 inflated larvae collected near Golden, Colo., June 5, 1901, by Dr. H. G. Dyar and A. N. Caudell on *Chrysothamnus*, and 2 alcoholic larvae labeled "Ex *Boerhavia* sp. Presidio, Tex., 6 Oct. 1944, No. 1876, Lot 45-16502." All from the U. S. National Museum.

*Distribution*.—Texas, Kansas, Nebraska, Colorado, New Mexico, Arizona, and California.

*Food plants.*—Rabbitbrush (*Chrysothamnus* sp.) and *Boerhavia* sp. There is a moth in the National Museum submitted by D. J. Caffrey from New Mexico labeled "Ex English ivy."

#### CUCULLIA MONTANAE Grt.

Head 3.7 to 3.8 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, tapering posteriorly; skin pavement-granulose; general color green with longitudinal black lines.

A bright yellow, continuous, middorsal stripe. The area between this and the dorsal apices of the spiracles occupied by 3 longitudinal darker stripes, the median stripe lighter than the others, all bordered by black lines which tend, in the darker stripes, to be broadened about midway of each segment, the two lines sometimes fused to form a black spot or stripe, the one in the line of the spiracles broadened to include or narrowly encircle each spiracle. Spiracles white. A broad subventral stripe, yellow dorsally, white on ventral third. Venter bluish green with a black line along base of prolegs, midventer with traces of two black lines. Setigerous tubercles minute. Head greenish white, with strong, large black freckles.

Described from many larvae collected near salt water in western Washington in August and September. Moths emerged in July and August of the following year and were determined by Clarke.

*Distribution.*—United States: Texas, New Mexico, Arizona, Utah, Colorado, Washington, Montana. Canada: Alberta.

*Food plant.*—Our specimens taken exclusively from *Grindelia*, but Cook, in his Montana list, records taking larvae on blossoms of rabbitbrush (*Chrysothamnus*).

#### CUCULLIA ASTEROIDES Gn.

Head 3.4 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, tapering distinctly posteriorly; skin obscurely pavement-granulose; general color green with black longitudinal lines.

Middorsal stripe white or yellow, continuous. Between this and the spiracles are three longitudinal darker stripes, the median stripe usually less dark than the others, bordered by black lines. In the dark stripe bordering the middorsal stripe the margining black lines tend to be broadened approximately midway of the length of each abdominal segment, the two lines sometimes fused to form a black spot or stripe. The margining black lines in the darker stripe at the spiracles are similarly broadened, the ventral line (in the line of the spiracles) broadened to include or, at least, to narrowly encircle each spiracle. Spiracles white with black rims. A broad white or yellow subventral stripe bordered ventrally by a black line. Venter green with traces of a white stripe in the line of the prolegs. Head green pavement granulose with large flat granules at the small brownish or blackish freckles, an area above antennal insertion and extending dorsally, whitish.

Described from the following 11 specimens: 3 live larvae, "Clarksville, Tenn., Oct. 5, 1927, on *Aster ericoides*"; 4 alcoholic larvae, "Chicago, Ill., Oct. 8, 1933, on small white aster, A. K. Wyatt coll."; 2 alcoholic larvae, "Chicago, Ill., Oct. 13, 1940, on *Aster novae-angliae*, A. K. Wyatt coll."; 2 alcoholic larvae, "New Jersey, Chas. Rummel coll."

*Distribution.*—United States: Colorado, Kansas, Nebraska, Iowa, Illinois, Tennessee, North Carolina, Maryland, Pennsylvania, New Jersey, New York, Massachusetts, New Hampshire, and Maine. Canada: New Brunswick.

*Food plants.*—Aster and goldenrod (*Solidago*).

## CUCULLIA sp. No. 9

Head 3.5 mm. broad. Body about 32 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin pavement-granulose; general color pale greenish yellow.

A strong, unmarked pale yellowish middorsal stripe margined by sharp black lines. Stripe including setigerous tubercles I and II dark infuscated purplish reticulate with white, the dark line at ventral margin obscure. Supraspiracular area to but not including III yellowish, without included black lines. A dark purplish stripe including III and dorsal half of spiracles, the margining dark lines obscure. Spiracles broad, a distinct brown, the centre of the sieve plate paler than the margin. Venter uniform yellowish, much flecked with white, with traces of a white line along bases of prolegs. Setigerous tubercles small, almost flat, but more than mere setal insertions. Head pale greenish overlaid strongly dorsally with purple interspersed with small, inconspicuous, yellowish green freckles.

Described from one larva collected on an arid hillside near Tieton in eastern Washington, May 30, 1939. No moth was reared.

*Distribution.*—Washington.

*Food plant.*—The larva was taken on the ground in the shade provided by small antelope-brush beside which a *Balsamorhiza* plant was growing. There was no other composite growing in the vicinity, and the larva fed to some extent upon the *Balsamorhiza*.

## CUCULLIA POSTERA Gn. race OMISSA Dod

Head 3.3 to 3.4 mm. broad. Body about 40 mm. long and 5 mm. broad at middle, tapering distinctly posteriorly; skin pavement granulose; occurs in a green phase and a purple phase. Green phase: Middorsal stripe bright yellow varying to greenish white. Laterad of this to and partially including the spiracles are five stripes on each side the darkest dorsal, the remainder tending to be alternately lighter and darker and all margined by slender black or occasionally dark greenish lines which do not tend to be broadened medially on the segments. Spiracles pale yellowish to pale brown. Subventral stripe greenish yellow dorsally, white ventrally. Ventrals of this to base of prolegs green with a yellowish white line extending along base of prolegs. Venter green with 3 yellowish white lines. Head green with small hyaline or blackish freckles posteriorly and white lines dorsad and ventrad of the ocelli. Purple phase: Similar to the foregoing except that much of the body and head are decidedly purplish.

Described from many larvae collected in Washington from about the middle of August through September. Moths emerged in May and June of the following year and were determined by Franclemont.

*Distribution.*—United States: Oregon, Washington, Pennsylvania, New Jersey, New York, New Hampshire, and Maine. Canada: New Brunswick, Quebec, Manitoba, Alberta, and British Columbia.

*Food plants.*—Aster, less often on goldenrod (*Solidago*).

## GENUS No. 2

## SPECIES No. 10.

Head 2.1 mm. broad. Body about 23 mm. long and 3 mm. broad at middle, tapering strongly posteriorly; skin smooth.

Dorsum reddish with a series of alternating, intersegmental black and yellow oblique spots arising subdorsally and converging posteriorly toward the mid-dorsum of the following segment. Spiracles dusky brown or black, included in the sinuate, pale subventral stripe. Venter dark. Setigerous tubercles large, flat, black. Head pavement-granulose, brown with black freckles.

Described from one larva swept from willow at night near Paradise at foot of Mount Rainier in Washington, August 7, 1930. No moth was reared.

*Distribution*.—Washington.

*Food plant*.—Willow.

### COIPANOLIS Grt.

#### COIPANOLIS STYRACIS (Gll.)

Head 3.37 mm. broad. Body about 28 mm. long and 5 mm. broad, tapering slightly posteriorly; skin set very closely with small rounded granules; general color apparently dark brown or black.

Cervical shield broadly margined with black laterally and posteriorly. Anal shield with two black spots on posterior half. No other markings visible. Spiracles apparently black. Setigerous tubercles moderately large, slightly convex, dark. Head brown, black along posterior margin and with black freckles on posterior half.

Described from one alcoholic larva, mature May 28, 1935, reared from the egg by Henry Bird.

*Distribution*.—Texas, Florida, South Carolina, Missouri, Illinois, Minnesota, Michigan, Pennsylvania, New York, and Massachusetts.

*Food plant*.—Oak (*Quercus alba*) (teste Bird).

### PSAPHIDA Walk.

#### PSAPHIDA CROTEI (Morr.)

Head 3.5 to 3.6 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, tapering strongly posteriorly; skin smooth; general color probably green or pale brown.

Color and markings obliterated by the preservative. Spiracles pale or pale brown with brown rim. Setigerous tubercles minute. Head pavement-granulose with sparse coarse granules, apparently unmarked.

Described from five alcoholic larvae: One "Ithaca, N. Y., May 1939, *Fraxinus pennsylvanica*, J. G. Franclemont reared" and four "Chicago, Ill., May 28, 1941, on ash, A. K. Wyatt coll."

*Distribution*.—Nebraska, Kansas, Missouri, Illinois, Ohio, Maryland, Pennsylvania, Massachusetts, New York, and Maine.

*Food plant*.—Ash trees (*Fraxinus*).

### EUTOLYPE Grt.

#### EUTOLYPE DEPILIS (Grt.)

Head 3.3 to 3.5 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly with a slight dorsal hump on abdominal segment 8; skin smooth; general color indeterminable but probably green.

A broad but much broken middorsal white line. A similar white line closely ventrad of setigerous tubercle II and another dorsad of III. Spiracles white with pale brown rim. A white subventral stripe including none of the spiracles and extending around the margin of the anal shield. Setigerous tubercles large, white, the dorsal tubercles round in outline and broadly subconical. Head obscurely pavement-granulose, apparently unmarked; mandible teeth serrate and including several denticles on dorsal margin of cutting edge.

Described from three inflated larvae in the U. S. National Museum, probably from the Barnes collection, and labeled "Ex ova, walnut, Decatur."

*Distribution.*—Texas, Kansas, Missouri, Iowa, Illinois, Ohio, Pennsylvania, Connecticut, and New York.

*Food plant.*—Walnut.

## GENUS No. 3

## SPECIES No. 11

This description is based on immature specimens. Head 2.37 mm. broad. Body about 22 mm. long and 3 mm. broad, tapering posteriorly; skin bearing very small, rounded granules interspersed among large, obscure, somewhat convex granules; general color black throughout.

A yellow middorsal stripe extending the full length of the body. A broken, inconspicuous pale line ventrad of setigerous tubercle II. The black spiracles well within the yellow subventral stripe on all segments. Setigerous tubercles large, somewhat elevated, black. Head smooth, brown, closely freckled with black.

Described from two larvae collected on the prairie near Parkland, Wash., June 16, 1934, and July 10, 1933, respectively. No moth was reared.

*Distribution.*—Washington.

*Food plant.*—Blossoms of false dandelion (*Hypochaeris radicata*).

## GENUS No. 4

## "ACRIPODES" TERATOPHORA (H.-S.)

This species is not at all closely related to *fallax* H.-S. with which it is now associated in the genus *Acripodes*. Probably it also does not belong in the Cucullinae but the structural characters of the larva are such that *teratophora* cannot be readily excluded.

Head 1.9 to 2 mm. broad. Body about 23 mm. long and 3 mm. broad at middle, abdominal segments of approximately equal width throughout to 8; skin smooth; general color green.

Body green, apparently unmarked excepting a strong white line well ventrad of setigerous tubercle II and a slender white line in the line of III. Middorsal pale line and subventral pale stripe entirely absent. Spiracles very small, white. Setigerous tubercles minute except that II is small and flat on 8 and 9. Head smooth, green, unmarked, segment 2 of antenna black on median face; mandible with 8 teeth on cutting margin and a large subbasal tooth on oral face.

Described from four alcoholic larvae collected near Chicago, Ill., June 14, 1941, by A. K. Wyatt.

*Distribution.*—Kentucky, Illinois, Ohio, Pennsylvania, and New York.

*Food plants.*—Oswego tea (*Monarda didyma*) and mint (teste Wyatt).

## FERALIA Grt.

1. A prominent, subconical hump on dorsum of abdominal segment 8. Antennal pedicel conspicuous yellow. Labial palpus and spinneret subequal in length (34:33). Reported from California only. Feeds on broad-leaved trees  
*fcbrualis*
2. A slight rounded hump on dorsum of abdominal segment 8. Antennal pedicel not yellow. Feeds on coniferous trees.----- 2
2. Setigerous tubercles I to VI large, slightly convex, white. Height of spiracle on abdominal segment 1 equal to that of the prothoracic spiracle (21:21). Labial palpus and spinneret subequal in length (26:22). Spiracles dark brown or black----- sp. (No. 12)

- Setigerous tubercles minute throughout. Height of spiracle on abdominal segment 1 less than that of prothoracic spiracle (20:25). Labial palpus much shorter than spinneret (30:43). Spiracles white..... 3
3. Subdorsal white line parallel-sided, not forming a segmental series of lanceolate spots. Subventral yellow stripe continuous, parallel-sided..... *deceptiva*
- Subdorsal white line narrowed or broken at juncture of segments forming a segmental series of lanceolate spots. Subventral yellowish stripe broken into a segmental series of spots, straight on dorsal margin and convex ventrally..... *jocosa*

#### FERALIA FEBRUALIS Grt.

Head 3.8 to 4 mm. broad. Body about 28 mm. long and 4.5 mm. broad at middle, abdominal segments of approximately equal width throughout to 8, with a very decided, subconical dorsal hump on 8; skin smooth; general color green with scattered yellowish or greenish white flecks.

Two yellowish white U-shaped figures joined base to base on dorsum of abdominal segment 8. Middorsal white line strong, continuous. A yellow line including most of the spiracles, extending around the anal shield and margined dorsally by a purple line. Venter deeper green than the dorsum, flecked with greenish white. Setigerous tubercles minute. Legs red exteriorly. Head smooth, whitish green, unmarked, base of antenna conspicuous yellow.

Described from six larvae collected on Soda Creek, Napa County, Calif., and in foothills near Sacramento in May 1933 by H. H. Keifer. A moth emerged March 3, 1934, at Puyallup, Wash., and was determined by Benjamin.

*Distribution.*—California.

*Food plants.*—*Cercocarpus betuloides* and oak (*Quercus douglasi*).

#### FERALIA sp. (No. 12)

The larva described below differs considerably in structure from the other species and may belong to some closely related genus. The specimen had lain in alcohol for 13 years before being described and, since the coloration is particularly evanescent in alcohol in this genus, there can be no assurance that the color description is accurate.

Head 3 mm. broad. Body about 27 mm. long and 4 mm. broad at middle, with abdominal segment 8 slightly broadened and slightly, roundly humped dorsally; skin smooth; general color probably green.

Middorsal white line strong but broken. White line ventrad of setigerous tubercle II much broken. Spiracles dark brown or black with infuscated brown rim. Subventral white stripe including the spiracles except on 8 and margining the anal shield, whether bordered dorsally by a red line or not is not determinable. No white line along bases of legs and prolegs is apparent. Setigerous tubercles large, gently convex, white. Head probably green, apparently unmarked.

Described from one alcoholic larva collected near Eugene, Oregon, June 6, 1930, by C. W. Getzenderer.

*Distribution.*—Oregon.

*Food plant.*—Unknown, probably Douglas-fir.

#### FERALIA DECEPTIVA McD.

Head 3.2 to 3.4 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly, with a slight, rounded dorsal hump on abdominal segment 8; skin intricately rugulose; general color dark green with prominent, white longitudinal stripes.

Dark green throughout with prominent, equal continuous white stripes mid-dorsally and slightly ventrad of setigerous tubercle II, the latter tinged with green at juncture of segments. Spiracles pale brown with brown rim. Sub-

ventral stripe uniform and unbroken, white tinged with yellow at juncture of segments, margined dorsally by a red line and including the spiracles. A yellow line across bases of legs and prolegs broken at the incisures but extending most of the length of each segment. Setigerous tubercles minute. Legs and prolegs largely red. Head smooth, pale green, unmarked.

Described from 23 larvae, mostly from the prairie about Parkland, Wash., in July. These become mature the latter part of July, and from material kept out of doors moths have emerged the latter part of March. These were determined by Clarke.

*Distribution*.—United States: California, Oregon, Washington. Canada: British Columbia and Alberta.

*Food plant*.—Douglas-fir (*Pseudotsuga taxifolia*).

#### FERALIA JOCOSA (Gn.)

Head 3 to 3.2 mm. Body about 30 mm. long and 5 mm. broad at middle, tapering slightly posteriorly with a distinct, rounded dorsal hump on abdominal segment 8; skin intricately rugulose; general color green with conspicuous longitudinal white lines.

Mid-dorsal white line continuous, broadest posterior to the middle of most segments. Subdorsal white line ventrad of setigerous tubercle II narrowed or absent at juncture of segments forming a segmental series of lanceolate spots. Subventral stripe including the spiracles, yellowish, broken at juncture of segments forming a segmental series of spots, straight dorsally, convex ventrally, and margined dorsally by a strong red line. Spiracles white with pale brown rim. A series of yellowish spots across bases of prolegs. Setigerous tubercles minute. Head green, sometimes with a few black flecks, otherwise unmarked.

Described from three inflated larvae from the U. S. National Museum, without data and three alcoholic larvae collected in Ontario and Quebec in August and received through the kindness of Mr. A. W. A. Brown, Chief, Forest Insect Survey, Ottawa, Canada. Moths are said to be found in March, April, and May.

*Distribution*.—United States: New Jersey, Pennsylvania, New York, Massachusetts, and Maine. Canada: Quebec and Ontario.

*Food plants*.—Black spruce (*Picea mariana*), balsam fir (*Abies balsamea*), and hemlock.

#### PLEROMA Sm.

In the aggregate, the writer has collected a large number of mature larvae of this genus without succeeding in rearing a single fully developed moth. The generic reference rests solely on the determination of one battered female taken at light as "*Pleroma* sp." by Dr. J. McDunnough. A single post-mortem egg was secured from this moth and the larva was reared nearly to maturity.

Either there are at least twice as many species as are indicated below or the coloration is subject to great individual variation in detail, including the color of the spiracles. The general color runs through subdued shades of brown and gray, sometimes somewhat infuscated, and is composed of light and dark longitudinal lines and stripes, usually without much contrast. The basic pattern is as follows:

A pale mid-dorsal stripe including a dark median line; a dark stripe, with ventral margin sinuate, including setigerous tubercles I and II, narrowing toward the incisures on abdominal segments 1 to 6; a pale area between II and III usually obscure on some abdominal segments; a dark stripe including III and partially including the spiracles; the mid-venter paler with a dark midventral line sometimes expanded to form dark splotches between the prolegs and head freckled with black. All of the species feed on snowberry (*Symphoricarpos*).

*Distribution.*—The combined distribution of the species of *Pleroma* includes: United States: Arizona, Colorado, Utah, California, Idaho, Montana, Oregon, and Washington. Canada: British Columbia and Alberta. The species recorded from Washington include: *bonuscula* Sm., *obliquata* Sm., and *cinerea* Sm.

Only such characters as seem to be of specific value are included in the following key, and Species No. 13 may belong to some closely related genus.

1. Setigerous tubercle II large and elevated throughout, especially on abdominal segment 8. Head entirely smooth. Middorsal pale stripe continuous across abdominal segment 8. The dark color of the stripe partially including the spiracles intensified to form a conspicuous black line at ventral margin. Body slender, tapering strongly posteriorly..... Species No. 13
- Setigerous tubercle II minute throughout. Dark color of stripe partially including the spiracles not intensified to form a conspicuous black line at ventral margin. Body stout, tapering but slightly posteriorly..... 2
2. Middorsal pale stripe broadly interrupted on abdominal segment 8. Head entirely smooth. A slight dorsal hump present on 8. Subventral pale stripe not margined ventrally by a black stripe. No black spot dorso-posterior to the spiracle on abdominal segment 7..... Species No. 14
- Middorsal pale stripe continuous across abdominal segment 8..... 3
3. A decided dorsal hump posteriorly on abdominal segment 8. Head pavement granulose dorsally. A conspicuous, small, black spot present dorso-posterior to the spiracle on abdominal segment 7. The dark color of the stripes including setigerous tubercles I and II intensified and diffused anteriorly on the dorsum or abdominal segments 1 to 6 to form a series of subscutate dorsal figures. Subventral pale stripe bordered ventrally by a black line..... Species No. 15
- Without a trace of a dorsal hump on abdominal segment 8. Head entirely smooth. Dorsum without a series of subscutate figures. With a dark purplish stripe ventrad to the subventral pale stripe, becoming more purplish midventrally..... Species No. 16.

#### PLEROMA sp. (No. 13)

Head 2.2 to 2.3 mm. broad. Body about 33 mm. long and 3.5 mm. broad, very slender and tapering strongly posteriorly; skin smooth; general color medium gray.

Described from five larvae collected from late in June to about the middle of July in dry areas about Puyallup, Wash. From a larva which spun up for pupation June 23, 1946, a moth emerged abortively out of doors March 26, 1947.

#### PLEROMA sp. (No. 14)

Head 2.5 to 2.7 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering slightly posteriorly with a slight dorsal hump on abdominal segment 8; skin smooth; general color brown or infuscated brown.

Described from 30 larvae collected near Tieton, Wash., and in the Blue Mountains of Oregon from early in June to about the middle of July. A moth of this species was taken at light April 6, 1941, and a larva was reared. This moth was determined by McDunnough as "*Pleroma* sp."

#### PLEROMA sp. (No. 15)

Head 2.4 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, tapering slightly posteriorly with a strong dorsal hump posteriorly on abdominal segment 8; skin smooth; general color brownish to dark gray.

Described from 16 larvae collected in Washington at Indian Flat, Sawmill Flat, and Hells Crossing Camp on Highway 410 on the eastern slope of the Cascade Mountains, from about the middle of May to the latter part of June. No moth has been reared.

*PLEROMA* sp. (No. 16)

Head 2.5 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, abdominal segments of approximately equal width throughout, no dorsal hump on abdominal segment 8; skin smooth; general color dusky brown.

Described from four larvae collected near Tieton, Wash., in June. No moth has been reared.

*HOMOHADENA*

1. Crochets uniordinal. Line of setae P<sup>2</sup> below apex of front. Head with black submedian arcs forming a small spot at posterior margin of head. No dorsal hump on abdominal segment 8.----- *badistriga*
- Crochets biordinal. Line of setae P<sup>1</sup> at apex of front. Head without black submedian arcs----- 2
2. A decided dorsal hump on abdominal segment 8. Strong white stripes dorsad of setigerous tubercle III and ventrad of the spiracles----- *fifa*
- No dorsal hump on abdominal segment 8. Stripes dorsad of setigerous tubercle III and ventrad of spiracle pale but not white----- *stabilis* (?)

*HOMOHADENA BADISTRIGA* (Grt.)

Head 2.5 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering posteriorly; skin bearing extremely small, rounded granules; general color brown.

A geminate middorsal pale line distinct on thorax and posterior abdominal segments, expanded on other segments to form a pale spot on posterior third of the segments from which pale lines diverge, include setigerous tubercles I and II of the following segment and then converge to the pale spot. A strong pale line slightly ventrad of II below which is a blackish stripe on abdominal segments. Lower third of supraspiracular area, including the spiracles, infuscated brown, upper two-thirds nearly white, flecked with brown and with a brown line near dorsal margin. Spiracles pale yellowish. Subventral pale stripe flecked with brown. Venter to base of prolegs brown with a strong white line along bases of prolegs. Setigerous tubercles minute. Head coarsely granulose, pale brown, the adfrontal areas black margined outwardly by a white stripe which is margined by the black submedian arcs; a white stripe dorsad of the ocelli.

Described from two inflated larvae, "Expt. Farms, Ottawa, Canada, 28 May, 1901" received through the kindness of Dr. J. McDunnough. Six immature alcoholic specimens collected near Chicago, Ill., May 28 to June 10, by A. K. Wyatt, have also been examined.

*Distribution.*—United States: Texas, Oklahoma, Missouri, Nebraska, Illinois, Michigan, Pennsylvania, Massachusetts, and New York. Canada: Ontario, Manitoba, Saskatchewan, and Alberta.

*Food plant.*—Honeysuckle (*Lonicera*).

*HOMOHADENA FIFIA* Dyar

Head 2 to 2.1 mm. broad. Body about 27 mm. long and 3.5 mm. broad at middle, tapering posteriorly with a strong dorsal hump on abdominal segment 8; skin smooth; general dorsal color dusky brownish.

A subdued middorsal pale stripe broadened posteriorly on each abdominal segment and including a slender dark line. An infuscated brownish stripe including setigerous tubercles I and II, a slender irregular line dorsad of I. A slender pale

line ventrad of II broadened on posterior fourth of abdominal segments and margined ventrally by a slender black stripe which is absent on thorax and posterior abdominal segments. A strong solid white stripe with III at ventral margin, absent on thorax and ill-defined on posterior abdominal segments; margined by slender dark lines. Partially including the spiracles a narrow stripe composed of blackish reticulation. Spiracles pale yellowish. A strong, narrow, white subventral stripe including a median lavender line and less conspicuous on posterior abdominal segments. An infuscated purplish stripe to base of prolegs, including a yellowish median line. Venter purplish reticulate with white, a mid-ventral dark line. Setigerous tubercles small, flat. Head coarsely granulose, white, with purplish brown submedian arcs absent on the occiput, a few black splotches adjacent to median line and occipital sinus; brownish splotches laterally; two brown stripes posterior to the ocelli: front white; the adfrontal areas black margined with white forming an inverted V-shaped figure.

Described from 14 larvae collected at Sawmill Flat and Indian Flat on Highway 410 on eastern slope of the Cascade Mountains in Washington in late May and early June by Joseph Wilcox, W. W. Baker, and the writer. From larvae collected May 31, 1936, a moth emerged July 2, 1936, which was determined by Clarke.

*Distribution.*—United States: Texas, Colorado, Utah, and Washington. Canada: British Columbia and Saskatchewan.

*Food plant.*—Snowberry (*Symphoricarpos*).

#### HOMOHADENA STABILIS Sm. (?)

Head 2 mm. broad. Body about 25 mm. long and 3.5 mm. broad at middle, tapering posteriorly; skin smooth; general color dark gray.

A strong yellowish middorsal stripe, orange at juncture of segments and including a dark median line. A dark stripe including setigerous tubercles I and II with pale lines dorsad of I and ventrad of II. Supraspiracular area to and including the spiracles dark with a median pale stripe. Spiracles yellowish brown. Subventral pale stripe margined ventrally by a dark stripe extending to base of prolegs, including a pale line in ventral half and bordered ventrally by a pale stripe. Midventer pale marked with reddish. Setigerous tubercles small. Head coarsely granulose, brown tinged with purplish dorsally, with black bars composed of fused freckles both laterally and medially in the area about seta P<sup>1</sup> and P<sup>2</sup>.

Described from two larvae collected near Pullman, Wash., May 15, 1932, and June 5, 1933, respectively, by J. F. Gates Clarke. From the first of these a female moth emerged June 20, 1932 (Moth No. 218 in U. S. National Museum). This was determined tentatively by F. H. Benjamin as a new species of *Oncocnemis* with the comment: "This is a species of *Oncocnemis* with the exact habitus of *Homohadena stabilis*." The larva appears to be a *Homohadena* and is tentatively included here as *stabilis* since *stabilis* has been collected at Pullman.

*Distribution.*—United States: Washington, Montana, Kansas, and Nebraska. Canada: Alberta.

*Food plant.*—Snowberry (*Symphoricarpos*) (teste Clarke).

#### ONCOCNEMIS Led.

- Hind coxae width of femur apart. Crochets biordinal (pl. 6, H). Spiracles dusky brown. Feeds on ash (*Fraxinus*). Distribution limited to areas west of the Rocky Mountains.----- *punctilinea*
- Hind coxae touching or very slightly separated. Crochets uniordinal (pl. 6, G)----- 2
- Spiracles black. Head dull purplish with black freckles. General dorsal color black. Feeds on *Penstemon*----- Species No. 17
- Spiracles white to very pale brownish. Head green usually with small dark freckles. General dorsal color not black.----- 3

3. A purplish line on head, arising dorso-posterior to the ocelli and bordered dorsally and ventrally by white lines. Postero-median setae on anal shield much closer to each other than to postero-lateral setae (11:17). Anal shield somewhat pointed posteriorly, shield shaped. Feeds on ocean spray (*Holodiscus*)----- Species No. 18  
 Coloration of head not as above. Postero-median setae on anal shield never more than slightly nearer to each other than to postero-lateral setae. Anal shield broadly rounded or subtruncate posteriorly. Feed on *Penstemon*--- 4
4. Ocellus III strikingly larger than II (diam. 11:8). Anal shield pavement granulate. Distribution limited to areas east of the Rocky Mountains  
 Ocellus III not larger than II (diam. 7:7). Anal shield smooth. Distribution limited to areas west of the Rocky Mountains----- *saundersiana*  
*umbri-fascia*

### ONCOCNEMIS PUNCTILINEA Hamp.

Head 2 to 2.2 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering posteriorly; skin smooth; general color light gray.

Coloration dorsally to and partially including the spiracles composed of stripes of dark reticulation alternating with somewhat diffuse pale stripes reticulate with white. A narrow dark middorsal line. The dark stripes include one through setigerous tubercle II, another including III and partially enclosing the spiracles and a narrow stripe midway between these. Spiracles dusky brownish. A white subventral stripe margined ventrally by a narrow black stripe including V. Venter to base of prolegs gray; midventer pale. Setigerous tubercles minute except IV and V moderately large. Head coarsely granulate, pale gray, with many dark freckles medially above the front and laterally.

Described from numerous larvae collected at Tempe, Ariz., and about 55 miles north of Phoenix in the Seven Springs Recreation Area in April by K. B. McKinney and the writer. Moths emerged in May and were determined by Benjamin.

*Distribution*.—Arizona, California, and Utah.

*Food plant*.—Ash trees (*Fraxinus*).

### ONCOCNEMIS sp. (No. 17)

Head 2.1 to 2.3 mm. broad. Body about 20 mm. long and 3.5 mm. broad at middle, tapering posteriorly; skin smooth; general color dull purplish black.

A narrow, white middorsal stripe including a brownish median line. A dull black line posterior to setigerous tubercle II on each abdominal segment except 8 and 9, bordered ventrally by a pale line. Including III and extending to V a white stripe, suffused with purplish dorsally, the black setigerous tubercles prominent. Spiracles black. Venter dull purplish black, with some pale reticulation on base of prolegs. Setigerous tubercles large, flat, black. Head coarsely granulate, dull purplish with close black freckles medially above front and laterally, forming stripes posterior to the ocelli.

Described from four larvae collected near Seven Springs Ranger Station about 55 miles north of Phoenix, Ariz., April 22, 1938. No moth was reared.

*Distribution*.—Arizona.

*Food plant*.—A species of *Penstemon* with purplish pink blossoms and smooth, thick, perfoliate leaves.

### ONCOCNEMIS sp. (No. 18)

Head 2.1 to 2.2 mm. broad. Body about 20 mm. long and 2.5 mm. broad at middle, tapering posteriorly; skin smooth; general color green.

Body markings may be more or less obliterated but when complete are as follows: A geminate middorsal white line; a white line or narrow stripe including setigerous tubercles I and II; a greenish white stripe including the spiracles well within it; a white line ventrad of V and 2 white lines in the line of the prolegs.

Spiracles pale with brown rim. Venter green. Setigerous tubercles large, somewhat elevated, white. Head coarsely granulose, green with a red or purplish dash arising dorso-posterior to the ocelli and margined dorsally and ventrally by white lines, some pale reticulation posterior to and ventrad of the ocelli.

Described from 10 larvae collected on Highway 410 at Pine Cone Camp west of the Currant Flat Ranger Station in eastern Washington, July 18, 1937. No moth was reared.

*Distribution.*—Washington.

*Food plant.*—Ocean spray (*Holodiscus discolor*).

#### ONCOGNEMIS SAUNDERSIANA Grt.

Head 2 mm. broad. Body about 32 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin smooth; general color indeterminable.

General color and markings obliterated in the alcoholic specimens at hand. Lateral setigerous tubercles moderately large. This larva is remarkable for the large size of ocellus III.

Four larvae have been examined: Collected June 15 to 25 at Fremont, Ind., and near Chicago, Ill., by A. K. Wyatt.

*Distribution.*—Texas, Kansas, Missouri, Illinois, Indiana, Pennsylvania, and New York.

*Food plant.*—Flowers of *Penstemon penstemon* (teste Wyatt).

#### ONCOGNEMIS UMBRIFASCIA Sm.

Head 2 to 2.2 mm. broad. Body about 30 mm. long and 3.5 mm. broad at middle, tapering posteriorly; skin smooth; general color green.

An obscure, narrowly geminate pale middorsal line. Inconspicuous, slender, wavy, pale lines including setigerous tubercle I and ventrad of II. Two obscure wavy pale lines dorsad of the spiracles. Spiracles white. A distinct white sub-ventral stripe, less sharply defined dorsally. Traces of a narrow pale stripe along bases of prolegs; mid-venter green, unmarked. Setigerous tubercles III to VI moderately large, also II posteriorly. Head coarsely granulose, with small, dark freckles.

Described from 20 larvae collected along the American River on Highway 410, mostly east of the Currant Flat Ranger Station in eastern Washington from late in May to about the middle of June. Moths emerged in July and were determined by Clarke.

*Distribution.*—United States: Colorado, Utah, Nevada, California, Washington, and Montana. Canada: British Columbia and Alberta.

*Food plant.*—A low, spreading species of *Penstemon*.

#### ADITA Grt.

Middorsal pale stripe overlaid with reddish reticulation and the contiguous stripe including I and II red, both without dark reticulation. Dorsum of head brown with black freckles. Feeds on an herb, *Triosteum perfoliatum*

*Adita* sp. (No. 181)

Middorsal pale stripe and the contiguous stripe including I and II partially overlaid with dark reticulation particularly on first abdominal segment. Dorsum of head suffused with blackish at least posteriorly, with black freckles showing through the suffusion. Feeds on ash trees----- *chionanthi*

#### ADITA sp. (No. 181)

Head 2.6 to 2.8 mm. broad. Body about 35 mm. long and 5.5 mm. broad, tapering posteriorly with a slight dorsal hump posteriorly on abdominal segment 8; skin smooth; general color reddish dorsally, mostly pale or green elsewhere.

Middorsal pale stripe overlaid by reddish reticulation. Setigerous tubercles I and II included in a reddish stripe, a pale line including I. A broad pale or green stripe from well ventrad of II to III. A narrow dark stripe including the spiracles. Spiracles brown. A sharply defined subventral pale stripe. Venter darker than the supraspiracular area with traces of a pale stripe along bases of prolegs. Setigerous tubercles minute. Head with coarse, convex, polished granules, brown, sparsely freckled with black particularly posteriorly, with a broad white stripe including the ocelli and broken into lines posteriorly.

Described from five larvae: 1 inflated "Millburn, N. J., June 1" from Charles Rummel; 3 alcoholic "Chicago, Ill., and Elgin, Ill., June 2-5, *Triosteum perfoliatum*" from A. K. Wyatt; and 1 alcoholic "Ithaca, N. Y., Apr.-May 1941, *Triosteum perfoliatum*" reared by J. G. Franclemont.

*Distribution*.—See under *chionanthi*.

*Food plant*.—*Triosteum perfoliatum*.

#### ADITA CHIONANTHI A. & S.

Head 3 to 3.1 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, tapering posteriorly with a small dorsal hump on abdominal segment 8; skin smooth; general dorsal color either gray, green, or strongly reddish.

Middorsal pale stripe more or less obscured by dark reticulation except near the incisures and abruptly broadened posteriorly on metathorax, 1 and 2. A sinuous pale longitudinal line including setigerous tubercle I and a straight pale line well ventrad of II. From this to but not including III either of dilute dorsal coloration with an obscure, dark median line or with this area intensely black in dorsal half. A narrow dark stripe usually including III and the spiracles. Spiracles brown. Pale subventral stripe sharply defined, more or less filled with reticulation and bordered by a dark line which fades out ventrally. A pale stripe extending across the bases of the prolegs, including VI and bearing a dark or reddish line. Dark purplish spots between the prolegs. Setigerous tubercles minute. Head bearing coarse, convex, polished granules, brown, strongly infuscated on posterior half with numerous black freckles, all ocelli in a broad, white band extending to posterior margin of head.

Described from three mature alcoholic larvae reared by J. G. Franclemont and labeled "Ithaca, N. Y., April-May, *Fraxinus pennsylvanica*."

*Distribution*.—This species and *Adita* sp. (No. 18.1) have long been confused and it is not possible at present to determine the range of either species. Their combined distribution includes Georgia, New Jersey, Pennsylvania, New York, Illinois, Kansas, Nebraska, Colorado, Wyoming, and Montana.

*Food plant*.—Ash trees (*Fraxinus*).

#### HOMONCOCNEMIS Hamp.

In connection with a determination of moths reared from ash-feeding larvae from Oregon in 1864, Mr. F. H. Benjamin made the following comment: "*Homoncocnemis fortis* Grt. In error as *picina* Grt. in most collections. There are 2 species, distinct on genitalia but very close in appearance." This statement is substantiated by the larvae as indicated below.

In collecting from *Penstemon* in Arizona a dark gray larva with markings fundamentally different from *fortis* has been found along with a dark green larva in which the markings seem to be somewhat different. We have not reared a moth from the green larva, but moths of "variety *picina*" were reared by Comstock and Dammers

(14) from such larva which they describe and figure. Moths from the gray larva were determined by Clarke as *Homoncoenemis fortis picina* (Moths 614 and 615 in U. S. National Museum) and the gray larva is described as *picina*. The green larva may be but a color phase of this species.

1. General color to well ventrad of spiracles black. Middorsal pale stripe distinct throughout; composed of four parallel pale lines. Spiracles dusky gray. Venter from ventrad of spiracles pale, tinged with orange dorsad of the prolegs. Head bluish white strongly freckled and streaked with dense black, front margined with black..... *fortis*  
General color to the spiracles dark gray or green. Middorsal pale stripe obscure or absent, not composed of parallel pale lines. Spiracles white. Coloration of venter not as above. Front not margined with black..... 2
2. General color dark gray. Middorsal pale stripe obscure anteriorly on the segments, broadening strongly posteriorly toward the incisure. Narrow subventral pale stripe margined ventrally by a strong black line. A series of livid spots between the prolegs. Head purplish gray with rather small dilute black freckles..... *picina*  
General color green. Middorsal pale stripe absent. Narrow subventral pale stripe not margined ventrally by a black line. No dark spots between the prolegs. Head pale greenish with scattered, small brownish freckles  
*picina* (?) (Green phase?)

#### HOMONCOENEMIS FORTIS (Grt.)

Head 2.5 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering posteriorly, with a slight dorsal hump on abdominal segment 8; skin smooth; general dorsal color to well ventrad of the spiracles black, venter pale.

Middorsal stripe distinct throughout, composed of four white or yellowish lines. A small white spot with setigerous tubercle I at ventral end and a larger, lanceolate white spot with II in ventral end. Several broken pale lines dorsad of the spiracles. Spiracles dusky gray. Subventral pale stripe extremely broad, including VI, much tinged with orange, dusky at the incisures, bordered ventrally by a strong white line extending across bases of legs and prolegs. Venter pale with two white lines. Setigerous tubercles somewhat more than mere setal insertions. Head bluish white very coarsely granulose, strongly freckled and striped with black, the front margined with black.

Described from many larvae collected at Oakland, Oreg., April 24, 1934, by Wm. W. Baker. These began spinning up for pupation soon afterward and moths emerged from late in August to early in September. Moths were determined by Benjamin.

*Distribution.*—Arizona, California, Utah, Colorado, and Oregon.

*Food plant.*—Ash trees (*Fraxinus*).

#### HOMONCOENEMIS PICINA (Grt.)

Head 2.5 to 3 mm. broad. Body about 33 mm. long and 5 mm. broad at middle, tapering posteriorly with a decided angular dorsal hump posteriorly on abdominal segment 8; skin smooth; general color dark gray.

Coloration made up of a coarse-meshed dark reticulation on a pale ground, somewhat more dense on dorsum to II, except as noted. Middorsal pale stripe more distinct posteriorly on the segments where it is conspicuously broadened toward the incisure. An inconspicuous gray longitudinal area between setigerous tubercles II and III including a median dark line. Including III and the spiracles a narrow blackish stripe. Spiracles white. Subventral pale stripe sharply defined, narrow, margined ventrally by a black line well dorsad of V except on 7 and 8. Venter to base of prolegs blackish. Midventer purplish gray with a dark midventral line enlarged to form livid spots between the prolegs. Setigerous tubercles moderately large, I and II white. Head closely, coarsely granulose, purplish gray, with rather small dark freckles.

Described from 10 larvae collected near the Seven Springs Ranger Station about 55 miles north of Phoenix, Ariz., April 13 to April 20,

1938. Moths emerged in October and were determined by Clarke as *Homonocnemis fortis picina* Grt.

*Distribution*.—Arizona and California.

*Food plants*.—Both shrubby and herbaceous species of *Penstemon*.

#### HOMONOCNEMIS PICINA (Grt.) (?) (Green Phase?)

Head 3 mm. broad. Body about 35 mm. long and 4 mm. broad, tapering posteriorly with a strong dorsal hump posteriorly on abdominal segment 8; skin smooth; general color dark green.

Coloration to base of prolegs uniform green except as noted. Middorsal pale stripe absent. Four slender, very sinuous, longitudinal pale lines between setigerous tubercle II and III. Spiracles white. A sharply defined, narrow, white subventral stripe. Two inconspicuous, sinuous pale lines dorsad of bases of prolegs. Midventer pale greenish with the median line somewhat darker than adjacent parts. Setigerous tubercles small. Head closely, coarsely granulose, some of the granules rather dark producing scattered small freckles.

Described from five larvae collected near Seven Springs Ranger Station about 55 miles north of Phoenix, Ariz., April 13 to April 20, 1938. No moth was reared.

*Distribution*.—California and Arizona.

*Food plants*.—Both shrubby and herbaceous species of *Penstemon*.

### Subfamily EUTELIINAE

Plants of proleg with a long, fleshy, process at each end of the series of crochets (pl. 10, O). Hind coxae more than the femur width apart. Tarsal setae broadened.

----- *Paectes*

Plants of prolegs without a fleshy process at each end of the series of crochets.

Hind coxae nearly or quite touching. Tarsal setae narrow, setiform

*Marathyssa, Eutelia*

No American larvae of *Eutelia* are available for examination, and the characters have been drawn from two inflated specimens of the European *Eutelia adulatrix*. *Marathyssa* and *Eutelia* are closely similar in all of the observed characters of generic importance, including the inflated thorax.

### PAECTES Hbn.

#### PAECTES DELINEATA (Gn.)

Head 2.7 mm. broad. Body about 25 mm. long and 4.5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color green, conspicuously dotted with yellow.

No middorsal or subdorsal pale lines visible in the specimen. A yellow line dorsad of the spiracles. Body marked rather closely with yellow dots. Spiracles yellow or orange with brown rim. Setigerous tubercles very minute. Prolegs with a large fleshy appendage apically at each end of the series of crochets, probably normally transverse but parallel to the long axis of the proleg in the inflated specimen. Head set closely with small round granules, markings not determinable.

Described from one inflated larva from the Brooklyn Museum, and now in the U. S. National Museum, bearing an old label "*Paectes declinata*" and no further data, the name applied probably being an error of transcription for *delineata* since, in all probability, the larva was collected in the East. Norman Criddle (17), in describing the larva of *Paectes oculatrix* Gn. from poison ivy, states that the prolegs

are developed into flat projections at the tips giving them the appearance of an inverted T.

*Distribution.*—New York, Massachusetts, New Jersey, North Carolina, Florida, Alabama, Missouri, Illinois, and Texas.

*Food plant.*—Leonard (New York list) records jasmine as food plant.

### MARATHYSSA Wlk.

#### MARATHYSSA INFICITA (Wlk.)

Head 2.4 mm. broad. Body about 18 mm. long and 3 mm. broad, abdominal segments of about equal width to 8 and the thorax having an inflated appearance particularly dorsally; skin smooth; general color probably green.

The only marking visible is a pale line slightly ventrad of setigerous tubercle I. Spiracles pale brown with pale brown rim. Setigerous tubercles and their setae minute. Venter of abdominal segment 10 free posteriorly. Head smooth, probably green, occipital angle obtuse.

Described from two alcoholic larvae collected near Kansas City, Mo., September 4, 1941, by A. K. Wyatt on sumac.

*Distribution.*—United States: Maine, Massachusetts, Connecticut, New York, Pennsylvania, Maryland, North Carolina, Tennessee, Georgia, Florida, Michigan, Minnesota, Illinois, Missouri, Nebraska, Kansas, Texas, and Utah. Canada: British Columbia and Saskatchewan.

*Food plants.*—Sumac and poison ivy (*Rhus* spp.).

### Subfamily BAGISARINAE (Subfam. nov.)

#### BAGISARA Wlk.

#### (ATETHMIA Hbn.)

There is a mystery locked up in the anatomy of members of this small genus. All of the principal characters of the larva are unmistakably primitive but the moths are rather stout and stubby winged, showing none of the superficial characters students of the moths have come to associate with the lower Phalaenidae (Quadrifinae), and authorities on the moths have objected to the position assigned to this genus here.

The exotic genus *Xanthodes* Gn. has all of the peculiarities found in *Bagisara*, differing only in that much reduced prolegs bearing a few crochets are present on abdominal segments 3 and 4.

#### BAGISARA RECTIFASCIA (Grt.)

Head 2.6 mm. broad. Body about 27 mm. long and 3 mm. broad at middle, tapering strongly posteriorly with prolegs absent on abdominal segments 3 and 4; skin smooth; general color probably green.

All traces of color or markings have been removed by the preservative. All setigerous tubercles large, subconical, their setae strong, the dorsal setae more than one-half as long as an abdominal segment (55:80). Tubercles I\* and I<sup>o</sup> separate on mesothorax and metathorax; IV and V fused on mesothorax; tubercles of the VII group well separated on abdominal segments to 4; VII\* slightly antero-ventrad of VII<sup>o</sup> on 3 and 4. Spiracles probably white with brown rim. Crochets on prolegs uniordinal. Head with coarse, elevated, polished granules medially; seta I<sup>o</sup> but the width of the setal insertion from lateral margin of front; third segment of labial palpus extraordinarily long, three times as long as basal segment or more (37:11) (pl. 10, D).

Described from nine alcoholic larvae from U. S. National Museum collected at Lake Charlotte, Tex., in August 1922, by F. M. Bottimer.

*Distribution*.—Texas, Alabama, Illinois, New Jersey, Pennsylvania, and New York.

*Food plants*.—*Hibiscus lasiocarpus* and *Malva viscus drummondi* (teste Bottimer).

### Subfamily HYPENINAE

1. Setigerous tubercles minute, VII<sup>p</sup> and VII<sup>s</sup> well separated on abdominal segment 1. Some tarsal setae broadly lanceolate. Feeds exclusively on buttonbush (*Cephalanthus*)..... *Legna*  
Setigerous tubercles large, VII<sup>p</sup> and VII<sup>s</sup> confluent on abdominal segment 1. Some tarsal setae slightly flattened but not lanceolate..... 2
2. Prolegs present on abdominal segment 3. Feed on foliage of deciduous trees..... *Bomolocha*  
Prolegs absent on abdominal segment 3. Feed on herbs..... 3
3. Head marked with black freckles. Feed exclusively on stinging nettle (*Urtica*) and hop..... *Hypena*  
Head unmarked. A general feeder, apparently preferring beans and clover..... *Plathypena*

### LEGNA Wlk.

#### LEGNA PERDITALIS (Wlk.)

Head 1.5 mm. broad. Body about 20 mm. long and 3 mm. broad at middle, tapering rather strongly posteriorly; skin smooth; general color green with a red middorsal stripe.

A red middorsal stripe and a longitudinal white line including setigerous tubercle II. No other markings. Spiracles apparently pale brownish with pale brown rim. Setigerous tubercles minute except some somewhat larger on abdominal segments 7, 8, and 9 and posteriorly on anal shield, the dorsal setae minute, their length equal to about one-tenth the length of a body segment. Some tarsal setae rather broadly lanceolate. Head smooth, green, with a pair of conspicuous red stripes arising above base of mandibles and converging to the occiput.

Described from three inflated larvae from the U. S. National Museum, "No. 2849, Aug. 22, 1882, on buttonbush," and many alcoholic specimens collected near Clarksville, Tenn., August 22, 1934, by J. U. Gilmore and Joe Milam.

*Distribution*.—New York, Massachusetts, New Jersey, Pennsylvania, West Virginia, Ohio, Illinois, Missouri, Colorado, Tennessee, North Carolina, Florida, Mississippi, Louisiana, and Texas.

*Food plant*.—Buttonbush (*Cephalanthus*).

### BOMOLOCHA Hbn.

- Setigerous tubercles of body green..... *palparia* Wlk.  
*bijugalis* Wlk.  
Setigerous tubercles of body pink..... *madefactalis* Gn.

#### BOMOLOCHA PALPARIA (Wlk.)

Head 2 mm. broad. Body about 17 mm. long and 3 mm. broad at middle, tapering strongly posteriorly; skin not examined; general color green.

The larva described is somewhat decolorized preparatory to pupation. Green throughout and apparently without markings. Setigerous tubercles rather large and distinctly elevated, green; their setae nearly or quite black. Spiracles yellow with brown rim. Head green, some of the setigerous tubercles black.

Described from one larva collected near Clarksville, Tenn., July 4, 1925. The moth emerged July 17, 1925, and was determined by Benjamin.

*Distribution.*—United States: Florida, Texas, Georgia, Maryland, Pennsylvania, Ohio, Illinois, Iowa, Minnesota, Wisconsin, New York, Connecticut, and Maine. Canada: Quebec and British Columbia.

*Food plant.*—Larva taken on trunk of oak.

#### BOMOLOCHA BIJUGALIS Wlk.

Head 2.1 mm. broad. Body about 25 mm. long and 3 mm. broad at middle, tapering posteriorly; skin smooth; general color dark green.

Body dark green dorsally, pale ventrally. A faint dusky longitudinal line including setigerous tubercle II; no other markings. Spiracles orange with brown rim. Setigerous tubercles rather large, subconical, pale green except III which is black. Head green with sparse black flecks on occiput and along median line.

Described from two larvae collected in western Washington in September by W. W. Baker. From a larva collected September 25, 1933, a moth emerged March 29, 1934. This moth was determined by Benjamin.

*Distribution.*—United States: Washington, Illinois, New York, New Jersey, Pennsylvania, North Carolina, Georgia, Florida, Mississippi, and Texas. Canada: Ontario, Manitoba, and British Columbia.

*Food plant.*—Dogwood (*Cornus*).

#### BOMOLOCHA MADEFACTALIS (Gn.)

Head 2.5 mm. broad. Body about 20 mm. long and 3 mm. broad at middle and tapering strongly posteriorly; skin smooth; general color green.

Green throughout with a broken white line ventrad of setigerous tubercle II. Setigerous tubercles large, strongly elevated, pink throughout, the dorsal setae about one-half as long as a body segment. Spiracles pale with brown rim. Head probably green, with a black spot anterior to seta P<sup>1</sup>.

Described from one inflated larva in the U. S. National Museum labeled "On walnut, Sept. 3, 1882, No. 2841."

*Distribution.*—North Dakota, South Dakota, Texas, Mississippi, North Carolina, Tennessee, Arkansas, Missouri, Illinois, Ohio, Pennsylvania, Maryland, New Jersey, Connecticut, and New York.

*Food plant.*—Walnut.

#### HYPENA Schrank

- |   |                    |
|---|--------------------|
| 1. Ground color of head green. Dorsum of body green.....  | 2                  |
| Ground color of head white. Dorsum dusky owing to the presence of close-set, very minute, rounded, blackish granules..... | <i>decorata</i>    |
| 2. Skin smooth, entirely without granules.....  | <i>californica</i> |
| Skin set closely with minute granules.....  | 3                  |
| 3. Granules of skin pointed, upright, spine-like.....   | <i>humuli</i>      |
| Granules of skin very minute, rounded, not upright.....   | <i>modesta</i>     |

#### HYPENA DECORATA Sm.

Head 2 mm. broad. Body about 25 mm. long and 3 mm. broad at middle, tapering decidedly posteriorly; skin bearing minute, rounded granules; general dorsal color dark.

Dorsum to ventrad of setigerous tubercle II dusky, with a dark middorsal stripe and setigerous tubercles I and II in pale spots. A strong dark stripe dorsal of III, remainder of suprspiracular area paler than the dorsum. Spiracles yellowish. The yellowish subventral stripe partially including the spiracles and more evident ventrally. Venter unmarked, tinged with pinkish. Setigerous tubercles large, subconical, pale or green, with rather large dark

setal insertions, III tending to be wholly black. Head pale, densely freckled with black, the freckles sometimes fused posteriorly, the setigerous tubercles black.

Described from many larvae collected near Puyallup, Wash., in June and July. Moths emerged in July and August and were determined by Heinrich.

*Distribution.*—United States: Washington, Oregon, and California. Canada: British Columbia.

*Food plant.*—Stinging nettle (*Urtica*).

#### HYPENA CALIFORNICA Behr

Head 1.8 mm. broad. Body about 20 mm. long and 2 mm. broad at middle, tapering decidedly posteriorly; skin entirely without granules; general color green, the venter paler.

A dark, subcutaneous middorsal line. A strong white line just ventrad of setigerous tubercle II and traces of a white subventral line. Spiracles white. Setigerous tubercles large, subconical, green, their setae about one-third as long as a body segment. Head green freckled with black.

Described from many larvae collected near Puyallup, Wash., in May, June, July, and August. Moths emerged in June, August, and September, and were determined by Schaus and by Clarke.

*Distribution.*—Occurs from Alaska, British Columbia, and Alberta southward through Washington and Oregon to California.

*Food plant.*—Stinging nettle (*Urtica*).

#### HYPENA HUMULI Harr.

Head 1.8 mm. broad. Body about 18 mm. long and 3 mm. broad at middle, tapering strongly posteriorly; skin bearing minute, setiform, pointed granules; general color green.

A geminate middorsal line and a line below setigerous tubercle II, white, otherwise green throughout. Spiracles pale yellowish with brown rim. Setigerous tubercles, including those on the venter, large, subconical, dark; the dorsal setae about one-half as long as an abdominal segment. Head green, with dilute black freckles, the setigerous tubercles dark.

Described from four alcoholic larvae in U. S. National Museum labeled "Richfield Springs, N. Y., June 1887" and many larvae collected on hop near Butte, Mont., September 4, 1934, by W. W. Baker.

*Distribution.*—United States: Washington, Idaho, Montana, South Dakota, Kansas, Colorado, Utah, California, Virginia, New Jersey, Pennsylvania, Massachusetts, New York, and Maine. Canada: Ontario, Alberta, and British Columbia.

*Food plants.*—Hop (*Humulus*) and stinging nettle (*Urtica*).

#### HYPENA MODESTA Sm.

Head 1.7 mm. broad. Body about 22 mm. long and 2 mm. broad at middle, tapering strongly posteriorly; skin bearing very minute, rounded granules; general color green.

Body green, apparently without markings. Setigerous tubercles large, subconical, green, with dark setal insertions. Spiracles pale with brown rim. Head green, faintly flecked with blackish, the setal insertions dark.

Described from one inflated larva in the U. S. National Museum labeled "Nevada Co., Calif., on nettle. No. 197."

*Distribution.*—California.

*Food plant.*—Stinging nettle (*Urtica*).

## PLATHYPENA Grt.

## PLATHYPENA SCABRA (F.)

Head 2 to 2.1 mm. broad. Body about 25 mm. long and 2.5 mm. broad at middle, tapering strongly posteriorly; skin bearing very minute rounded granules; general color green.

A geminate, indefinite middorsal white line. A narrow, broken white line slightly ventrad of setigerous tubercle II. A narrow white subventral stripe including the spiracles. Venter green. Setigerous tubercles large, subconical, green, their setae about one-third as long as a body segment. Head smooth, green, unmarked.

Described from many larvae collected near Clarksville, Tenn., in April and August by J. U. Gilmore and the writer. From larvae collected late in April, moths emerged about the middle of May. These were determined by Dyar.

*Distribution.*—Generally distributed from Florida to Nova Scotia and westward to North Dakota, Nebraska, Kansas, and Texas.

*Food plants.*—Beans, clover, alfalfa, and strawberry. The larvae collected in August had completely defoliated a small field of beans.

## Subfamily PHALAEININAE

The genera in the Phalaeninae are fairly well defined, although it has been found necessary to merge several genera in the *Euwoa-Agrodis* group, following Barnes and Benjamin (1), and also to indicate several additional genera, all of which had been foreshadowed by McDunnough (31). In a few cases, notably in *Graphiphora*, variation among the species has made it necessary to include a genus at several points in the key and in *Anomogyne* specific variation is such that the distinctive food plants constitute the only known differentiating character.

*Pronoctua*, placed here somewhat doubtfully by McDunnough, seems to be definitely phalaenid; *Ufcus* has been removed from the Phalaeninae and made the sole representative of a new subfamily, and *Pseudoglaea* seems to belong in a small group of genera including *Eucirrhoedia*, *Epiglaea*, and *Chaetoglaea*, formerly placed in the Cuculliinae but here transferred, of necessity, to the Amphipyriinae.

1. Mandible without a basal tooth or process on oral face (pl. 5, I-N). Setigerous tubercle II<sup>a</sup> on metathorax usually without a sclerotized bar connecting the seta with the ventral muscle attachment (pl. 7, T)----- 2  
Mandible with a basal tooth or process on oral face (pl. 5, A-II) except in a few species in which a contrastingly colored sclerotized bar is present on metathorax connecting II<sup>a</sup> with the ventral muscle attachment\* (pl. 7, U).  
12
2. Setigerous tubercle II<sup>b</sup> on mesothorax without a sclerotized ventral bar connecting the seta with the ventral muscle attachment (pl. 7, O). With a strong V-shaped impression midventrally anterior to the prolegs. Seta V nearer to IV than to VI on abdominal segment 6. Skin granulose. Setigerous tubercles large----- 3  
Setigerous tubercle II<sup>b</sup> on mesothorax with a sclerotized ventral bar (variable in *Pseudorthosia*) (pl. 7, P). Skin smooth. Setigerous tubercles I to IV usually minute, mere setal insertions. Seta V nearer to VI than to IV on abdominal segment 6 in normally distended specimens----- 4

\*The mandibular tooth is absent in "*Anomogyne infimatis*, *Anomogyne perquiritata*, and "*Protolampra*" *brunnicollis* and is sporadically absent in a few other species including *Graphiphora c-nigrum*.

3. Setigerous tubercle III on abdominal segment 9 and II<sup>b</sup> on thorax with a superficial annulus about base of seta, the seta normal, small but similar to other setae (pl. 7, N). No callus between femoral setae.--- *Copablepharon*  
 Seta III on 9 and II<sup>b</sup> on thorax in a black saucer-shaped depression, the seta lax and thread-like (pl. 7, M). A callus present between femoral setae.  
*Agrotis* (including *Euxoa*, *Chorizagrotis*, and *Feltia*)
4. Hypopharynx narrow, two and one-half to three times as long as wide, the gorge bearing spinules nearly or quite throughout (pl. 11, J). Line of setae P<sup>2</sup> well above apex of front. Length of median line of head usually equal to height of front. Ocelli IV and VI at least nearly twice the width of III apart (28:15)----- 5  
 Hypopharynx approximately twice as long as wide, the gorge without spinules except at extreme anterior end (pl. 11, J). Line of setae P<sup>1</sup> at or below apex of front. Length of median line of head distinctly less than height of front. Ocelli IV and VI less than twice the width of III apart.----- 7
5. The space between setae P<sup>1</sup> subequal to that between setae P<sup>2</sup> with either sometimes slightly the greater. Postero-median setae on anal shield nearer to each other than to the postero-lateral setae (21:25)----- *Lozagrotis*  
 Setae P<sup>1</sup> much farther apart than setae P<sup>2</sup> (42:36 or more). Postero-median setae on anal shield farther from each other than from the postero-lateral setae (27:24) (pl. 6, E)----- 6
6. Mandible with ribs on oral face and with large blunt teeth on cutting margin. Spiracles black----- *Hemicuxoa*  
 Mandible without ribs on oral face and entirely without teeth on cutting margin (pl. 5, I). Spiracles white----- *Anicia*
7. With a V-shaped impression midventrally anterior to the prolegs (very narrow and often indistinct or absent in *Pseudorthosia*). Spinneret without spinules on apical margin. Height of spiracle on 8 and on prothorax differing in a proportion on the order of 28:24 or less----- 8  
 Without a V-shaped impression midventrally anterior to the prolegs. Spinneret normally with spinules on apical margin but these sometimes absent. Height of spiracles on 8 and on prothorax differing in a proportion on the order of 32:26 or more----- 10
8. Second and third segments of labial palpus of equal length and minute, their combined length equal to approximately one-sixth the length of the first segment or less. Length of median line of head equal to two-thirds height of front or more. Spiracles white----- *Spuelotis*  
 Third segment of labial palpus at least twice as long as second segment, their combined length equal to approximately one-third length of first segment or more. Length of median line of head equal to half height of front or less. Spiracles black----- 9
9. Setae P<sup>1</sup>-P<sup>3</sup> on head closer together than P<sup>2</sup>-P<sup>2</sup> (48:57). Spinneret nearly as long as wide (11:14). Setigerous tubercles moderately large but nearly flat.----- *Actebia*  
 Setae P<sup>1</sup>-P<sup>3</sup> farther apart than setae P<sup>2</sup>-P<sup>2</sup> (58:54). Spinneret one-half as long as wide or less. Setigerous tubercles minute, mere setal insertions.----- *Pseudorthosia*
10. Occipital angle decidedly acute. Blade of maxillulae with about 14 teeth. Spiracles black----- *Peridroma*  
 Occipital angle a right angle or more. Blade of maxillulae with about 8 teeth. Spiracles not black----- 11
11. Spiracle on 8 narrow, the sieve plates (within the rim) approximately one-third as wide as high or less (8:27, 6:27). Third segment of labial palpus more than half as long as basal segment (11:19). Spinneret as long as wide or more. Ocelli III and IV close together, one-eighth the width of III apart or more (2:16, 4:16)----- *Cerastis*  
 Spiracle on 8 broader, the sieve plates usually nearly one-half as broad as high (13:29). Third segment of labial palpus less than half as long as basal segment (7:19). Spinneret usually broader than long. Ocelli III and IV all but touching, one sixteenth the width of III apart (1:16) or less (1:20)----- *Choephora*
12. Feed exclusively on coniferous trees. Structural variation among species great----- *Anomogyna*  
 Do not feed on coniferous trees----- 13

13. With third segment of labial palpus at least twice as long as the second segment, or with denticles or spinules on apical margin of spinneret<sup>1</sup> (pl. 2, B-E). Length of spinneret sometimes equal to twice the median width..... 14  
 Third segment of labial palpus, at most, but slightly longer than the second segment (4:3). Apical margin of spinneret without spinules or denticles (pl. 2, G-I). Spinneret short, usually broader than long, the length never approaching twice the width..... 27
14. Labial palpus with combined length of segments 2 and 3 approximately equal to length of basal segment (the difference 17:20 or less). Length of spinneret equal to twice the median width or more. Labial palpus and spinneret subequal in length..... 15  
 Labial palpus with combined length of segments 2 and 3 equal to approximately half the length of the basal segment or less or, if longer, with length of spinneret less than twice the width..... 17
15. With denticles or spinules on apical margin of spinneret. Setigerous tubercle IV on 6 ventro-posterior to spiracle, well below ventral end of spiracle. Ocelli III and IV one-fourth width of III apart or less (3:13).  
*Ochropleura*  
 Without denticles or spinules on apical margin of spinneret (pl. 2, A). Setigerous tubercle IV on 6 usually medio-posterior or dorso-posterior to spiracle, never below line of ventral end of spiracle..... 16
16. Ocelli III and IV at most less than one-third the width of III apart (4:14). Length of outer face of tibia, measured opposite tooth on femur, but slightly greater than the width (difference 31:27 or less)..... *Diarsia*  
 Ocelli III and IV at least more than one-third the width of III apart (8:20). Length of outer face of tibia, measured opposite tooth on femur, somewhat greater as compared with the width (difference 36:28 or more).  
*Pseudospaelotis*
17. Length of spinneret equal to one and one-half times the median width or more and subequal to that of the labial palpus..... 24  
 Length of spinneret usually less than the width, at most but slightly greater than the width except in some species with labial palpus approximately twice as long as the spinneret..... 18
18. With spinules or denticles on apical margin of spinneret..... 22  
 Without spinules or denticles on apical margin of spinneret (a long median process normally present in *Heptagrotis*)..... 19
19. Oral face of mandible normally with two basal teeth arising from different ribs. Hypopharynx with gorge and lobes forming one narrow, convex part, the median part (gorge) granulose throughout  
 Genus No. 5 (*Rhynchagrotis* in part)  
 Oral face of mandible with but one basal tooth. Hypopharynx broad, with gorge and lobes distinct, the gorge granulose at extreme anterior end only..... 20
20. Ocelli III and IV one-third width of III apart (5:15). Third segment of labial palpus but twice as long as second (4:2)  
*Setagrotis* in part (*planifrons*)  
 Ocelli III and IV more than one-third width of III apart (8:19) or more (12:20). Third segment of labial palpus three times as long as second (9:3) or more (11:2)..... 21
21. Mandible with a crenulate dorsal margin on cutting edge. Line P<sup>1</sup>-P<sup>1</sup> well above apex of front. Spinneret normally with a long median process on apical margin..... *Heptagrotis*  
 Mandible without a crenulate dorsal margin on cutting edge. Line P<sup>1</sup>-P<sup>1</sup> at or slightly below apex of front. Spinneret without a median process on apical margin..... *Eurois*

<sup>1</sup> This spinneret character is variable, appearing in about 95 percent of the specimens in which it is normally present. The denticles or spinules often are asymmetrically arranged and the number may be reduced to but one or two. When spinules or denticles are entirely absent, linear longitudinal thickenings of the spinneret are present which, when produced beyond the margin, form the normal denticles or spinules, either of which may occur in the same species.

22. Labial palpus with second and third segments of equal length. Ocelli III and IV nearly half width of III apart (6:13)----- 23  
 Labial palpus with third segment twice as long as second or more, or with ocelli III and IV one-fourth the width of III apart (3:13) or less (1:15)----- *Graphiphora* in part "*Anomogyne*" *inflatas*
23. Emargination in labrum very broad and shallow, depth of emargination equal to one-sixth length of labrum (5:30). Femoral setae, setae on median face of coxae and VIII on prolegs moderately slender, setiform  
*Setagrotis* in part (*piscipellis*)  
 Depth of emargination in anterior margin of labrum equal to approximately one-fourth length of labrum (9:38). Femoral setae, setae on median face of coxae and VIII on prolegs very stout, spurtlike----- *Pronoctua*
24. Third segment of labial palpus no longer than second segment. With spinules on apical margin of spinneret----- *Anaplectoides*
- Third segment of labial palpus twice as long as second segment----- 25
25. With denticles or spinules on apical margin of spinneret  
*Graphiphora* (variants)  
 Without denticles or spinules on apical margin of spinneret----- 26
26. Mandible with a crenulate or denticulate dorsal margin on cutting edge and without a basal tooth on oral face----- Genus No. 6 (*brunneicollis*)  
 Mandible without a crenulate or denticulate dorsal margin on cutting edge and with a tooth on oral face arising from a rib----- *Hemigraphiphora*
27. Ocelli IV and VI approximately twice the diameter of III apart (20:16), or more. Height of prothoracic spiracle normally equal to or slightly greater than height of spiracle on 8 and much greater than height of spiracle on 1 (29:23). Dorsal setae set in small, flat, black tubercles  
*Graphiphora* in part (*bicarnea*, *flavotincta*)  
 Ocelli IV and VI distinctly less than twice diameter of III apart (difference on the order of 26:16 or less). Height of prothoracic spiracle less than height of spiracle on 8 and but slightly greater than height of spiracle on 1 (20:18). Dorsal setigerous tubercles minute, mere setal insertions----- 28
28. With a small, rounded, middorsal hump on 1 and a smaller hump on 2  
*Adeiphagrotis*  
 Without humps on abdominal segments 1 and 2  
*Protolumpra*, *Abagrotis*, *Rhynchagrotis*

## COPABLEPHARON Harv.

1. Head suffused with blackish with infuscated brown or black freckles showing through the infuscation; width in mature larva 2.6 mm. Setigerous tubercle IV much smaller than the spiracle on abdominal segment 2. Frontal setae approximately six times as near to closest point on lateral margin of front as to each other (6:36). Spiracle on abdominal segment 8 half as broad as high----- *alba*  
 Head white faintly tinged with brown, with pale brown freckles. Frontal setae not more than twice as near to lateral margin of front as to each other (20:35), (16:32)----- 2
2. Head 3.4 mm. broad in the mature larva. Spiracle on abdominal segment 8 half as broad as high (14:28). Setigerous tubercle IV on abdominal segment 2 much smaller than the spiracle. Venter whitish----- *absida*  
 Head 3 mm. broad in mature larva. Spiracle on 8 two-thirds as broad as high (17:25). "Venter almost a sky blue." Seamans (37)----- *viridisparva*

## COPABLEPHARON ALBA Harvey

Head 2.6 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering slightly posteriorly; skin finely pavement-granulose; general color light brownish gray to whitish.

A subcutaneous dark line with a white line superimposed and a white line slightly ventrad of setigerous tubercle II. In well-marked specimens the dorsum and a line bordering the subdorsal white line ventrally are a subdued, inconspicuous pinkish but this color may be entirely absent. Spiracles infuscated brown sometimes appearing black. No subventral pale stripe. Venter pale. Cervical

and anal shields tinged with blackish with a pattern of dark freckles. Setigerous tubercles small, flat, brown, IV much smaller than the spiracle on abdominal segment 2. Middle and hind coxae widely separated. Head suffused with fuscous except brown ventrad of and posterior to the ocelli, with sparse infuscated brown or black freckles showing through the infuscation.

Described from 10 mature larvae collected a few miles west of Naches, Wash., July 28, 1940, by Wm. W. Baker, S. E. Crumb, Jr., and the writer. Moths of this species were emerging in numbers at the time the larvae were collected. Moths determined by Clarke.

*Distribution*.—Washington, Oregon, Nevada, California, Montana, Colorado, New Mexico, and Nebraska.

*Food plant*.—The larvae were collected gnawing the bark from bases of stems of *Mentzelia laevicaulis* and apparently feed on the blossoms of this plant in earlier instars.

#### COPABLEPHARON ABSIDA (Harvey)

Head 3.4 mm. broad. Body about 33 mm. long and 5 mm. broad at middle, tapering strongly posteriorly; skin finely pavement-granulose; general color pale gray.

Skin translucent even in the dark markings. Dorsum to and including the spiracles dilute blackish more or less tinged with brown especially posteriorly. A strong, broad, middorsal white line, another immediately ventrad of setigerous tubercle II, and a third in the line of III. Spiracles deep infuscated brown, appearing black. Subvepter white, extending upon base of prolegs. Venter whitish with an obscure dark line midway between V and VI. Setigerous tubercles, except IV, very small but more than setal insertions, pale brown, flat. Middle and hind coxae widely separated. Cervical shield tinged with fuscous. Anal shield white. Head white faintly tinged with brown with pale brown freckles.

Described from 35 larvae collected in dry sand along the Columbia River 1 miles west of Vantage, Wash., August 7, 1940, by J. F. Gates Clarke, Wm. W. Baker, S. E. Crumb, Jr., and the writer. Moths began to emerge early in September, but many of the smaller larvae passed the winter out of doors without feeding. Moths determined by Clarke.

*Distribution*.—Washington and Oregon.

*Food plants*.—Larvae were taken in the dry sand beneath sand verbena (*Abronia*), grass, and a trailing legume.

#### COPABLEPHARON VIRIDIPARSA Dod.

Head 3 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering strongly posteriorly; skin finely pavement-granulose; general color probably pale gray or pale brown.

No markings are visible in the mature inflated larva but white middorsal and subdorsal lines are present in the immature specimen. Seamans (37) states that the venter is almost a sky blue. Spiracles black. Setigerous tubercles small, flat, brown. Head coloration not determinable with certainty but apparently pale brown with pale brown freckles.

Described from 2 inflated specimens, 1 mature, bearing No. 7274, received through the kindness of H. L. Seamans.

*Distribution*.—United States: Washington, Oregon, and Colorado. Canada: British Columbia and Alberta.

*Food plant*.—Seamans took a larva feeding on mustard in drifted soil in April.

## THE AGROTIS COMPLEX

It has been found necessary to adopt a broad conception of the genus *Agrotis* outlined to me in conversation by Benjamin, since the larvae seem to offer no characters of generic importance upon which to base separations in this complex, including *Euxoa*, *Chorizagrotis*, *Agrotis*, and *Feltia*, and comprising more than 200 species.

In spite of the lack of structural differences, the species now included in *Euxoa* and *Chorizagrotis* may be separated from those now included in *Agrotis* and *Feltia* on the basis of head coloration, as indicated below, if *Agrotis orthogona* and *A. vetusta* (*muraenula* G. & R.) are included in the *Euxoa* group.

Head more or less reticulate with black or brownish and without freckles except in earlier instars of *Agrotis ypsilon*. Submedian arcs usually fully developed (pl. 8, B). Skin often bearing coarse, isolated granules (pl. 8, C, D)

Reticulation of head replaced entirely by black or brown flecks like freckles (pl. 8, F). Submedian arcs usually vestigial. Skin finely pavement granu-  
lose (pl. 8, A)-----  
The *Agrotis* group  
The *Euxoa* group

## The EUXOA Group

The writer has not been able to develop a satisfactory key to the species of larvae in the economically important *Euxoa* group. This unwieldy aggregation might well present problems to the systematist in any case, but in *Euxoa* the difficulties are multiplied owing to a strong tendency toward uniformity in coloration and structure throughout the group coupled with considerable individual variation in the small number of characters which offer some possibility of usefulness in differentiating species.

## The AGROTIS Group

1. Skin granules very small, flat or slightly convex and nearly or quite contiguous like blocks in a pavement, without secondary granules (pl. 8, A)----- 7  
Skin granules coarse, isolated, strongly convex or bluntly conical and interspersed irregularly among small secondary granules (pl. 8, C, D)----- 2
2. Skin granules bluntly conical and inclined posteriorly (pl. 8, D). Setigerous tubercle I of abdominal segments about one-half as large as II. Setigerous tubercle IV but slightly if at all larger than the spiracle

*subterranea* (*Feltia*\*)

Skin granules strongly convex but scarcely subconical and not inclined posteriorly (pl. 8, C). Setigerous tubercle IV usually at least twice as large as the spiracle except in *herilis*----- 3

3. Setigerous tubercle I of abdominal segments nearly or quite as large as tubercle II----- 4

Setigerous tubercle I of abdominal segments about one-third as large as II. Dark coloration of supraspiracular area not intensified subdorsally to form a black area on anterior half of each abdominal segment----- *ypsilon*

4. Dark coloration of supraspiracular area intensified subdorsally forming a black area on anterior half of each abdominal segment. Skin without a coppery, metallic luster. Adfrontal sutures usually terminating in the occipital angle----- 5

Dark coloration of supraspiracular area not intensified as above. Skin with a coppery metallic luster. Adfrontal sutures terminating on the median line----- *manifesta*

\* Generic names in parentheses indicate the genus under which the species is usually listed.

5. Setigerous tubercle IV at least twice as large as the spiracle. Number of crochets on anterior proleg in the mature larva varying from 5 to 12, the usual number being 7 to 9.----- 6  
 Setigerous tubercle IV but slightly if at all larger than the spiracle. Number of crochets on anterior proleg of mature larva varying from 11 to 13. Spinneret somewhat wider than long (14:10)----- *hevilis* (*Feltia*)
6. Spinneret very short, about three times as wide as long (12:4) (pl. 2, G)----- *subgathica* (*Feltia*)  
 Spinneret longer, about twice as wide as long (15:9) (pl. 2, H)----- *ducens* (*Feltia*)
7. Length of median line of head equal to approximately one-half height of front, or more. Head 3 to 3.1 mm. broad and each anterior proleg with 7 to 10 crochets in the mature larva. With a slender, pale, middorsal line, the width equal to approximately one-seventh of the space between setigerous tubercles I on abdominal segment 3 (7:50). Not conspicuously marked with white subventrally. Hind coxae less than the femur width apart (9:15)----- 8  
 Length of median line of head equal to approximately one-fifth height of front (7:33) or less.----- 9
8. Setigerous tubercle II unusually large, transverse diameter on abdominal segment 3 equal to more than one-half the space between I and II (13:20). Pale ground color of head partially obscured by diffuse infuscation. Claw on leg usually without a basal tooth.----- *vancouverensis*  
 Transverse width of setigerous tubercle II on abdominal segment 3 equal to less than one-half the space between I and II (10:25). Pale ground color of head not partially obscured by diffuse infuscation. Leg claw with a basal tooth.----- sp. (No. 19)
9. Conspicuously spotted with white subventrally to base of prolegs and with a white spot including setigerous tubercle III and the spiracle. Claw on leg without a basal tooth. Hind coxae less than the femur width apart (15:78). Each anterior proleg with 10 to 15 crochets in the mature larva.----- *malafida*  
 Not conspicuously spotted with white subventrally and without a white spot including III and the spiracle.----- 10
10. With a middorsal pale stripe, the width on abdominal segment 3 equal to one-third the space between setigerous tubercles I (20:55). Hind coxae approximately one-half the femur width apart (6:16). Head 3.1 mm. broad and each anterior proleg with about 16 crochets in the mature larva. Claw on leg with a basal tooth.----- *brocha* (*Euxoa*)  
 With a slender, pale middorsal line, the width on 3 equal to approximately one-eighth the space between setigerous tubercles I (8:65). Each anterior proleg with from 3 to 7 crochets in the mature larva.----- 11
11. Dorsum, at most, but faintly paler than the supraspiracular area. Claw on leg with a basal tooth. Hind coxae normally approximately twice the femur width apart (27:14)----- *venerabilis*  
 Dorsal area sharply defined and distinctly paler than the supraspiracular area. Claw on leg without a basal tooth. Hind coxae, at most, but slightly more than the femur width apart (20:16)----- *gladiaria*

#### ACROTIS SUBTERRANEA (F.) (FELTIA) (ANNEXA Treit)

Head 3 to 3.2 mm. broad. Body about 30 to 40 mm. long, tapering somewhat posteriorly; skin bearing isolated, bluntly conical, somewhat retrorse coarse granules interspersed irregularly among many minute secondary granules; general color gray.

Dorsum ashy gray overlaid with sandy brown and ferruginous, paler than the sides especially laterally. Spiracles black. Subventer and venter flecked with white to an unusual degree. Setigerous tubercles large, dark, and but slightly elevated, II on the abdomen twice as large as I. Each anterior proleg with about 8 to 12 crochets. Head ground color pale brownish or yellowish with black submedian arcs and black to ferruginous reticulation often more or less obsolete.

Described from many live larvae. There are about 3 broods in northern Tennessee and 5 or 6 in Louisiana, but the larvae do not be-

come common in Tennessee until late in the season. Crumb (19) gives an account of this species with figures.

*Distribution*.—Occurs from South Dakota, Nebraska, Kansas, and Texas eastward to Massachusetts, Connecticut, New Jersey, Virginia, North Carolina, and Florida. Westward the species is reported from Colorado, Arizona, and California. This species also occurs in the West Indies, Central America, and South America, and probably does not breed regularly in the more northern portions of its range.

*Food plants*.—Larvae have been taken attacking a wide variety of plants and are found exclusively in cultivated land.

#### AGROTIS YPSILON (Rott.)

Head 3.2 to 3.5 mm. broad. Body about 30 to 45 mm. long and 7 mm. broad, of nearly equal width throughout; skin bearing convex, rounded, distinctly isolated, very coarse, granules interspersed among smaller similar granules; general color above the spiracles nearly uniform, varying from light gray to nearly black.

Spiracles black. Subventer and venter with numerous pale flecks. Setigerous tubercles on the abdomen large, II transverse and 3 times as large as I. Each anterior proleg with about 16 to 21 crochets. Head pale brownish with black submedian arcs and reticulation.

The winter is passed in the pupal stage probably as an adult within the pupal shell, and there are four broods in northern Tennessee. Crumb (19) gives an account of this species with figures.

*Distribution*.—Occurs throughout the United States, in the adjacent Provinces of Canada, and rather generally throughout the world.

*Food plants*.—A very general feeder.

#### "AGROTIS" MANIFESTA (Morr.)

We follow Dr. McDunnough's (31) tentative assignment of this species to the genus *Agrotis* with considerable hesitation, since no larval specimens are available and the old description does not provide sufficient anatomical data upon which to base an opinion as to its systematic position, and yet seems to indicate some deviation from the usual *Agrotis* pattern.

Head 3.2 mm. broad. Body about 32 mm. long and 7 mm. broad at middle, very heavy-bodied, tapering slightly to the blunt posterior extremity; skin bearing coarse, isolated granules exactly as in *Agrotis ypsilon*, with a distinct, somewhat coppery, metallic sheen; general color an inconspicuous dark gray.

Dorsum obscurely paler than the sides. Ventral portion of the dark supra-spiracular area and the venter much splotched with white. Setigerous tubercles large, black, I and II of approximately equal size, IV much larger. Each anterior proleg with about six crochets. Head deep decided brown with black submedian arcs and close black reticulation concentrated to form spots in the ocular region; adfrontal sutures terminating on the median line before reaching the occipital angle.

Described from two mature live larvae collected January 18, 1919, at Hixson, Tenn., by J. U. Gilmore. Both moths emerged February 23, 1919, in a warm greenhouse. Dyar determined the moths.

*Distribution*.—Tennessee, Pennsylvania, New Jersey, Connecticut, and New York.

*Food plant*.—The normal food plant is not known but the two larvae seen were reared on white clover.

## ACROTIS HERILIS (Grt.) (Feltia)

Head 2.8 to 2.9 mm. broad. Body about 30 mm. long and 5.5 mm. broad at middle, tapering slightly posteriorly; skin bearing coarse, isolated granules; general color pale grayish.

No characters are known for distinguishing this species from *ducens* and *subgothica* other than those employed in the key to the species, and the description given for *ducens* probably will serve equally well for *herilis*.

But a few larvae of this species have been seen. This is a one-brooded species. Larvae hatched September 27, 1923, were mature April 7, 1924, and a moth emerged September 24, 1924. Moth determined by Dyar.

*Distribution.*—Occurs in all of the adjacent Provinces of Canada and discontinuously across the United States, the records including: Washington, Oregon, Montana, Utah, Colorado, Arizona, Texas, New York, Massachusetts, Pennsylvania, New Jersey, Maryland, Illinois, North Carolina, and Tennessee.

*Food plants.*—Probably a general feeder.

## ACROTIS SUBGOTHICA (Haw.) (Feltia)

Head 2.7 to 2.9 mm. broad. Body about 30 mm. long and 5.5 mm. broad, tapering slightly posteriorly; skin bearing coarse, isolated roundly subconical granules; general color pale grayish brown sometimes tinged with ferruginous.

No characters are known for distinguishing this species from *ducens* and *herilis* other than those employed in the key to the species, and the seasonal history is very similar to that of *ducens*. Crumb (19) gives an account of this species with figures.

*Distribution.*—Occurs discontinuously across the United States westward to Montana and Utah north of the latitude of the southern boundaries of North Carolina and Tennessee and also in New Mexico and Texas. It also occurs in British Columbia and Quebec.

*Food plants.*—A very general feeder.

## ACROTIS DUCENS (Wlk.) (Feltia)

Head 2.5 to 2.9 mm. broad. Body about 22 to 32 mm. long and 5.5 mm. broad, tapering slightly posteriorly; skin bearing coarse, distinctly isolated, roundly subconical granules; general color pale grayish brown sometimes tinged with ferruginous.

Dorsum paler than the suprspiracular area, often with a segmental series of ovoid or rhomboidal figures. Suprspiracular area flecked with white ventrally, the dark coloration intensified subdorsally to form a black spot on at least the anterior half of each abdominal segment. Spiracles black. A stripe made up of pale flecks ventrad of the spiracles. Setigerous tubercles large, black, I on the abdomen at least nearly as large as II. Each anterior proleg with from 5 to 12 crochets, the usual range being 7 to 9. Head very pale brownish gray with black submedian arcs and black to ferruginous reticulation.

This is a one-brooded species. The winter is spent as larvae in the third and fourth instars, these beginning to become mature and enter aestivation the last of March and most have entered the inactive stage

by the middle of May. The main emergence of moths occurs between September 10 and October 10 in northern Tennessee. Crumb (19) gives an account of this species with figures.

*Distribution.*—Generally distributed throughout the United States north of the latitude of the southern boundaries of North Carolina and Tennessee, and is found in all of the adjacent Provinces of Canada.

*Food plants.*—A very general feeder.

#### ACROTIS VANCOUVERENSIS Grt.

Head 3 to 3.1 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin pavement granulose; general color dark gray.

Dorsum to and but partially including setigerous tubercle II sharply paler than the sides and including a segmental series of dark ovoid figures which are more definite posteriorly. Including II and extending almost to III is a dark stripe. From this to base of prolegs reticulate with white which is gradually less obvious ventrally. No distinct pale subventral stripe. Spiracles entirely black. Venter sordid gray. Hind coxae less than the femur width apart (9:15). Setigerous tubercles large, black. Cervical shield black, showing the middorsal line only. Head with diffuse infuscation, dark submedian arcs and close dark reticulation, the pale ground color but little evident, especially posteriorly.

Described from 16 larvae reared from the egg. Parent moth determined by Benjamin. The parent moth was taken in the field June 18, 1935; deposited eggs which hatched June 25, 1935, and some of the larvae were mature August 16, 1935. Mature larvae have also been taken in the field in September.

*Distribution.*—United States: Washington, Oregon, and California eastward to Montana, Wyoming, and Colorado. Canada: British Columbia and Alberta.

*Food plants.*—Probably a general feeder. Has been taken in the field feeding on clover and strawberry.

#### ACROTIS sp. (No. 19)

Head 3.1 mm. broad. Body about 32 mm. long and 4.5 mm. broad, tapering slightly posteriorly; skin pavement granulose; general color gray, the dorsum tinged with purplish.

Middorsal pale line inconspicuous, margined by a dark shade. Dorsum including setigerous tubercle II paler than the supraspiracular area. An inconspicuous pale line ventrad of II. Supraspiracular area dusky, without distinct markings. Spiracles entirely black. No pale subventral stripe. Venter pale, unmarked. Cervical shield dark with three pale lines. Setigerous tubercles rather large, flat, black. Head pale, without diffuse infuscation, with black submedian arcs and reticulate with black on posterior margin.

Described from 10 larvae collected in western Washington and Oregon, most of which were taken on beach sand dunes in September. No moths reared.

*Distribution.*—Washington and Oregon.

*Food plants.*—Beach strawberry and probably various other plants.

#### ACROTIS MALEFIDA Gr.

Head 3 to 3.4 mm. broad. Body about 35 to 40 mm. long and 6 mm. broad at middle and 6 mm. thick, very heavy bodied, tapering slightly posteriorly; skin very finely pavement-granulose; dorsum and most of the supraspiracular area nearly unicolorous, the tint varying from light gray to blackish.

A conspicuous white spot including setigerous tubercle III on each abdominal segment. Spiracles black. Venter and subventer, including the spiracles, pale

with many white splotches. Setigerous tubercles large, dark, and of somewhat variable size, I on the abdomen usually being about as large as II. Each anterior proleg with about 12 to 15 crochets. Head pale grayish or brownish with black submedian arcs and black to ferruginous reticulation which may be sparse.

Described from many live larvae. The winter is spent in the pupal stage and there seem to be four broods in Texas on the basis of material received from D. C. Parman. Crumb (19) gives an account of this species with figures.

*Distribution.*—The normal breeding range probably is confined, almost entirely, to the States bordering on Mexico and the Gulf of Mexico, but moths have been taken in Tennessee, North Carolina, District of Columbia, Pennsylvania, New Jersey, and New York. One larva has been collected in northern Tennessee.

*Food plants.*—The known food plants include a wide variety of field and garden crops and other plants.

#### ACROTIS BROCHA (Morr.) (Euxoa)

This larva is listed as an *Euxoa* but has the reticulate head characteristic of *Agrotis*.

Head 3.1 mm. broad. Body about 34 mm. long and 5 mm. broad at middle, tapering slightly posteriorly; skin very finely pavement-granulose; general color dark gray.

A pale middorsal *stripe* reticulate with ferruginous. A band of dark reticulation including setigerous tubercles I and II margined dorsally and ventrally by black lines. Somewhat more than dorsal half of supraspiracular area occupied by a pale band reticulate with infuscated ferruginous. Ventral portion of the supraspiracular area, including the spiracles, dark. Spiracles entirely black. A subventral band of pale flecks indefinite toward ventral margin. Venter pale flecked with white. Cervical shield black with three white lines. Setigerous tubercles large, flat, dark, II distinctly larger than I. Each anterior proleg with about 15 crochets. Head white with black submedian arcs and reticulation, the reticulation brownish anteriorly.

Described from three live larvae collected by J. Wilcox, C. W. Getzendaner, and the writer in eastern Washington. Larvae become mature in June and July and the one moth reared emerged late in July. Moth determined by Franclemont.

*Distribution.*—United States: Washington and Nevada, eastward to Utah, Colorado, Nebraska, and Kansas. Canada: British Columbia.

*Food plants.*—Larvae have been reared on clover, plantain, and false dandelion (*Hypochaeris radicata*).

#### ACROTIS VENERABILIS Wlk.

Head 3.3 to 3.5 mm. broad. Body about 40 to 43 mm. long and 6.5 mm. broad at middle, tapering somewhat posteriorly, the segments with a convex lateral outline; skin finely pavement-granulose; general color nearly uniform dark, dull grayish varying to nearly black with obscure pale flecks.

Dorsum faintly paler than the sides especially laterally. Traces of pale lines middorsally and subdorsally, two pale lines in supraspiracular area and a band of pale flecks subventrally. Spiracles black. Venter dull plumbeous gray with obscure pale flecks. Setigerous tubercles large, black, nearly or quite flat, II on the abdomen twice as large as I. Each anterior proleg with about 5 to 9 crochets in the mature larva. Head ground color very pale brownish much obscured by the heavy black submedian arcs which are much broader dorsally, the black reticulation unusually sparse and sometimes absent.

This is a one-brooded species. The larva has a long aestivating period beginning in the spring and moths begin to emerge in September. Crumb (19) gives a brief account of this species with figures.

*Distribution.*—Occurs from Nova Scotia, Ontario, Manitoba, and Alberta southward to California, Arizona, New Mexico, Texas, and Florida, although not common in the East, south of the latitude of Tennessee and Virginia. The species is uncommon in Washington.

*Food plants.*—The larva has been reared on clover and chickweed and has been reported as attacking oats and garden plants.

#### ACROTIS GLADIARIA Morr.

Head 3.1 to 3.2 mm. broad. Body about 37 mm. long and 5.5 mm. broad when extended, first four abdominal segments of about equal width tapering posteriorly; skin finely pavement granulose; general color pale grayish varying to slightly darker.

Dorsal area sharply defined, distinctly paler than the supraspiracular area and tinged with ferruginous. Spiracles entirely black. Venter waxy gray varying to dusky grayish. Setigerous tubercles large, black and nearly or quite flat, II twice as large as I on the abdomen. Each anterior proleg with about 6 crochets in the mature larva. Head grayish brown with black submedian arcs and reticulation.

Described from many live larvae. This is a one-brooded species. The larvae begin to become mature the latter part of March and nearly all are mature by the first of May in northern Tennessee. Crumb (19) gives an account of this species with figures.

*Distribution.*—Found generally east of the Mississippi River but not common south of the latitude of Tennessee and Virginia. In the west, larvae have been seen from South Dakota, Colorado, and Utah.

*Food plants.*—The larva is a rather general feeder on field, garden, and berry crops and has been particularly destructive in Illinois and Kentucky.

#### LOXAGROTIS McD.

Cervical shield dilute blackish with white lines. Setigerous tubercles minute, mere setal insertions. Head of mature larva 2.4–2.6 mm. broad. Skin smooth

Cervical shield dense black with brown lines. Setigerous tubercles small but with a distinct sclerotized area. Head of mature larva 3.7 mm. broad. Skin obscurely roughened

*apicalis*

*albicosta*

#### LOXAGROTIS APICALIS (Grt.)

Head 2.4 to 2.6 mm. broad. Body about 25 mm. long and 4.5 mm. broad at middle, tapering distinctly posteriorly; skin smooth; general color apparently gray.

Dorsum to setigerous tubercle II paler than the sides excepting a segmental series of ovoid, dark middorsal figures. Middorsal and subdorsal pale lines obscure. Coloration to and including the spiracles otherwise uniform. Spiracles black or brown. A broad pale subventral stripe with V in ventral margin. Cervical shield and anal shield with reticulation distinctly darker than elsewhere. Setigerous tubercles minute. Head pale brown with black submedian arcs and dilute black reticulation, a large pale area above antennal insertion, spinneret without spinules or denticles on anterior margin.

Described from five alcoholic specimens collected by A. K. Wyatt at Elgin and Warrensville, Ill., September 21–October 4, from *Kuhnia eupatorioides*. Moths determined by Franclemont.

*Distribution.*—Utah, Colorado, Nebraska, Illinois, Arizona, New Mexico, Kansas, and Texas.

*Food plant.*—False boneset (*Kuhnia eupatorioides*).

## LOXAGROTIS ALBICOSTA (Sm.)

Head 3.7 mm. broad. Body about 40 mm. long and 5 mm. broad at middle, tapering posteriorly; skin obscurely roughened but not granulose; general color probably gray.

The dark markings described below are barely indicated by sparse groupings of black flecks or reticulation. Middorsal and subdorsal pale lines obscure. A segmental series of ovoid, black dorsal figures tending to form small black spots at the juncture of the segments. Dorsum to well ventrad of setigerous tubercle II otherwise pale. A sinuate black stripe with III in ventral margin more evident in an oblique area anteriorly on abdominal segments. Ventrad of this to and including the spiracles very sparsely flecked or reticulate with black. Spiracles brown with black rims. A white subventral stripe probably present. Venter apparently pale. Setigerous tubercles small but not mere setal insertions. Cervical shield black with three brown longitudinal lines. Head smooth, a decided brown with the submedian arcs and reticulation black, spinneret usually with spinules or denticles on apical margin.

Described from four alcoholic larvae from U. S. National Museum labeled "Rupert, Ida., 1945 (Fall), Beans, Lot No. 47-2448, R. H. Denton coll."

*Distribution.*—United States: Idaho, Kansas, Nebraska, Iowa, Utah, Colorado, Arizona, New Mexico, and Texas. Mexico. Canada: Alberta.

*Food plant.*—Has caused damage to beans in Colorado and Idaho.

## HEMIEUXOA McD.

## HEMIEUXOA RUDENS (Harv.)

Head 3 mm. broad. Body about 27 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width, heavy-bodied; skin smooth; general color light gray to dark gray.

Middorsal pale line obscure, obliterated by a small black spot at juncture of segments. A segmental series of obscure, somewhat shield-shaped dorsal figures may be indicated, especially posteriorly. A subdorsal pale stripe present immediately ventrad of setigerous tubercle II. A broken, obscure pale line in the line of III. Spiracles and III in a dark stripe intensified to form black spots posteriorly on mesothorax and metathorax. Spiracles black. Subventral pale stripe made up of white reticulation tinged with purplish and extending ventrally to but not including V. Venter pale tinged with purplish and reticulate with white. Setigerous tubercles minute. Head white with black submedian arcs and reticulation, a white stripe arising above antennal insertion and partially covered by reticulation posteriorly, spinneret short and often appressed to the labium.

Described from nine larvae collected III.22 to V.10.38 at Superior and Canyon Lake, Ariz., and one larva collected IV.14.19 at Uvalde, Tex., by D. C. Parman. Five moths emerged between May 2 and June 12, 1938. Moths determined by Clarke, some of these being of the form *pellucidalis* Grt.

*Distribution.*—California, Utah, Colorado, Nebraska, Kansas, Arizona, New Mexico, Texas, North Carolina, and Florida.

*Food plants.*—Snake weed (*Gutierrezia wrightii*) and grass.

## ANICLA Grt.

## ANICLA INFECTA (Ochs.)

Head 2.6 to 2.8 mm. broad. Body about 28 mm. long and 5.5 mm. broad at middle, tapering slightly posteriorly; skin smooth; general color varying from gray through yellowish ferruginous, olivaceous yellow and bright green to a sordid brown, usually flecked with black.

The following markings are usually present: A pale, sharply defined subventral stripe margined ventrally by a dark shade which fades out ventrally; on each segment except prothorax a pair of dorsal round white dots set a little before the middle of the segment near the subdorsal line and more or less margined with black; posterior to and ventrad of these white dots a velvety black splotch which may form a more or less connected subdorsal stripe; posterior to this black spot a pair of parallel, longitudinal pale lines, the ventral one of which may be continuous. Setigerous tubercles minute. Spiracles white or yellowish with black rims. Head pale grayish with dark submedian arcs and reticulation, the reticulation fused anteriorly to form about 4 dark lines, a narrow pure white stripe upon and posterior to the base of the antennae.

Described from many live larvae. There are 3 or 4 broods of this species in northern Tennessee and the winter is passed in the pupal stage. Crumb (19) gives an account of this species with figures under *Lycophotia infecta* Ochs.

*Distribution.*—Generally distributed east of the Rocky Mountains, south of the latitude of the Ohio River and into South America as far south as Brazil. North of this latitude moths have been reported from North Dakota, Illinois, New York, Massachusetts, Pennsylvania, New Jersey, and Manitoba, Canada, but the species probably does not survive the winter in these latitudes.

*Food plants.*—Beets, bluegrass, clover, crab grass, Muhlenbergia, plantain, purslane, and tobacco, the normal food being various grasses.

#### SPAELOTIS Bdv.

1. Middorsal pale line continuous, broad, the width equal to one-fourth the space between setigerous tubercles I on abdominal segment 3 (10:41), and very slightly invaded, if at all, by the margining reticulation. Ground color of head white. Subdorsal line white.----- *haviorae*  
Middorsal pale line narrow, the width equal to one-tenth the space between setigerous tubercles I on 3 (4:42) and tending to be invaded and more or less obscured by the margining reticulation medially on the abdominal segments. Ground color of head pale brown. Subdorsal pale line conspicuous yellow (eastern specimens) or white (western specimens)----- *clandestina*

#### SPAELOTIS HAVILAE (Grt.)

Head 2.7 mm. broad. Body about 25 mm. long and 4 mm. broad, abdominal segments of approximately equal width throughout; skin smooth; general color light gray.

A broad, distinct, continuous middorsal line. Dorsum light gray reticulate rather uniformly with blackish. A strong, continuous white subdorsal line broadened and directed dorsad, in more dilute intensity, posteriorly. Margining the subdorsal line dorsally a segmental series of dark markings linear anteriorly and wedge-shaped on abdominal segments 7 and 8. Supraspiracular area nearly uniformly blackish reticulate, but slightly darker toward ventral margin. Spiracles pale yellowish white. A distinct white subventral stripe. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head white with black submedian arcs and reticulation.

Described from six live larvae collected April 3, 1933, near Yakima, Wash. A moth, determined by Benjamin, emerged May 26.

*Distribution.*—Occurs from Washington, Oregon, and California eastward to Montana, Wyoming, Utah, Colorado, Nebraska, Arizona, and New Mexico; also in British Columbia and Alberta, Canada.

*Food plants.*—Probably a general feeder. Larvae have been taken about *Eriogonum*.

## SPÆLOTIS CLANDESTINA (Harr.)

Head 2.7 mm. broad. Body about 28 mm. long and 5 mm. broad, of approximately equal width throughout; skin smooth; general color varying from pale gray to dark gray.

Dorsal area sharply defined. A slender, broken pale middorsal line. A series of black subdorsal spots tending to be present on all abdominal segments, broadly linear or ovoid on anterior segments, becoming wedge-shaped on 7 and 8 and tending to include setigerous tubercle I in an, usually more dilute, angular extension, the two spots on each segment thus tending to form a more or less definite W-shaped figure. A distinct white or yellow subdorsal line broadened posteriorly on each segment to reach or include setigerous tubercle IX. Supraspiracular area rather uniformly dark except that the color is intensified in an obscure, oblique stripe on each segment arising at anterior margin and extending ventro-posteriorly and in the line of the spiracles. Spiracles pale yellowish or white. Subventral stripe made up of pale flecks. Venter much flecked with white. Setigerous tubercles minute. Head pale, brownish, with black submedian arcs and reticulation.

Described from many live larvae collected in Washington. Mature larvae are found in April and moths begin to emerge late in May. Crumb (19) gives a brief account of this species with figures, based on a few borrowed eastern specimens. The purported figure of the mandible is that of some other species. McDunnough determined moths.

*Distribution.*—Occurs generally from California, Nevada, Utah, Colorado, Nebraska, Illinois, Pennsylvania, and New Jersey, northward including all of the adjacent Provinces of Canada and Alaska. South of this region moths have been taken in Arizona and North Carolina.

*Food plants.*—A general feeder on trees, shrubs, and a great variety of herbaceous plants.

## ACTEBIA Steph.

## ACTEBIA FENNICA (Tausch.)

Head 3 to 3.2 mm. broad. Body about 32 mm. long and 4.5 mm. broad, tapering posteriorly; skin smooth; general color black or brownish black.

Dorsum pale laterally, infuscated or black medially, the dark pigmentation sometimes arranged in a connected segmental series of ovoid markings. From immediately ventrad of setigerous tubercle II to and partially including the spiracles black with a pale line near the dorsal margin. Spiracles apparently black. Subventral stripe broad, pale with ferruginous centre. Venter of dilute dorsal coloration. Setigerous tubercles small but not mere setal insertions. Cervical shield and anal shield black. Head yellowish brown, front, adfrontal areas and a broad margin beside them black. reticulation replaced entirely by dilute blackish freckles which are arranged in lines posterior to the ocelli.

Described from six mature alcoholic larvae received from W. C. Cook and labeled "Hennepin Co., Minnesota, May 26, 1919" and three alcoholic specimens from the U. S. National Museum bearing number 3379. Apparently this is a one-brooded species, the larval damage being done before the end of May or early in June in Canada. Gibson (27) gives a brief account of the species with figures.

*Distribution.*—Occurs generally in the latitude of Maine, New Hampshire, New York, Minnesota, and Montana; also in British Columbia, and northward to Alaska.

*Food plants.*—A very general feeder. Phipps (35) lists 40 species of plants belonging to 20 families which the larva has been observed to attack. It is a climbing species and also assumes the armyworm habit when numerous.

## PSEUDORTHOSIA Grt.

## PSEUDORTHOSIA VARIABILIS Grt.

Head 3.8 mm. broad. Body about 36 mm. long and 6.5 mm. broad at middle, abdominal segments of equal width, extremely thick, blunt posteriorly; skin smooth; general color dark gray.

Middorsal and subdorsal pale lines obsolete or nearly so, a yellowish middorsal spot at posterior margin of each abdominal segment. Dorsum scarcely paler than the suprspiracular area, much flecked with black especially medially. A segmental series of linear black marks subdorsally on anterior half of each abdominal segment except posterior on 8. Suprspiracular area slightly darker ventrally but without a distinct dark stripe at the spiracles. Spiracles black. Subcenter and venter much flecked with white, which is more conspicuous immediately ventrad of the spiracle where a definite subventral pale stripe may be evident. Cervical shield black with three pale lines. Scitigerous tubercles minute. Head decided brown with strong black submedian arcs to apex of front, more dilute posteriorly and sometimes with faint brownish reticulation laterally.

Described from numerous live larvae collected in Washington. Larvae have been collected from April until June. A larva collected May 9 was still a larva in the pupal cell June 17, pupated July 10, and the moth emerged August 9, 1930. Moth determined by McDunnough.

*Distribution*.—United States: California, Utah, Colorado, Oregon, and Washington. Canada: British Columbia and Alberta.

*Food plants*.—Larvae have been taken about strawberry and *Aster* and beaten from shrubs at night.

## PERIDROMA Hbn.

## PERIDROMA MARGARITOSA (Hbn.) form SAUCIA (Hbn.)

Head 3 to 3.2 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, the posterior extremity somewhat enlarged and very blunt; skin smooth; general color varying from very pale gray to the more usual dark fuscous.

Pale middorsal line represented on abdominal segments 1 to 4 by a distinct yellow or orange dot which may also be present on some of the following segments. A black W-shaped mark, open anteriorly, on dorsum of 8 followed by a conspicuous yellow or orange area. A segmental series of linear black marks subdorsally margined ventrally by a broken yellowish or orange line forming an inconspicuous dot about midway of each segment. Suprspiracular area occupied by a more or less definite sinuous dark stripe narrowed or more or less obsolete at the spiracles. Spiracles black. Subventral stripe mingled orange and yellow. Head whitish with broad, black submedian arcs and more or less dark reticulation.

Described from many larvae from various sources. Four generations per year are produced in northern Tennessee, the winter usually being spent in the pupal stage. Crumb (19) gives an account of this species with figures.

*Distribution*.—Occurs in Alaska; throughout the United States and Canada, southward into South America, and in Europe and the Mediterranean region generally.

*Food plants*.—A very general feeder on field and garden crops, on the foliage and fruit of trees and vines, and on various plants in greenhouses and cold frames.

## CERASTIS Ochs.

## CERASTIS TENEBRIFERA (Wlk.)

Head 2.7 to 3 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, heavy-bodied with abdominal segments 7 and 8 somewhat broadened; skin smooth; general color pale, or possibly greenish, with dilute black reticulation.

Body sparsely reticulate with dilute black to base of prolegs except as noted. Middorsal pale line obscure except on the thorax, the indefinite margining dark lines fused to form a series of small spots at juncture of segments. A segmental series of diffuse dark marks extending obliquely between setigerous tubercles I and II, more distinct on abdominal segments 7 and 8. A pale line ventrad of II connected with a pale area posterior to this tubercle. Spiracles in small, oblique black spots. Spiracles white. A pale subventral stripe reaching but not including V, bordered by white lines, margined ventrally by a dark line and filled with purplish. Setigerous tubercles minute. Head noticeably small for size of larva, pale brown with black submedian arcs and reticulation.

Described from four alcoholic larvae collected by A. K. Wyatt, VI.26.1940, at Chicago, Ill., and five alcoholic larvae collected by J. G. Franclemont, April-May 1941, at Ithaca, N. Y.

*Distribution.*—Nebraska, Illinois, Maryland, Pennsylvania, New Jersey, New York, New Hampshire, and Maine; also Newfoundland.

*Food plants.*—Lettuce, linden, grape (teste Wyatt), and dandelion (teste Franclemont), these probably referring to plants fed upon in confinement.

**CHOEPHORA Grt.**

**CHOEPHORA FUNCORUM G. & R.**

Head 3 to 3.1 mm. broad. Body about 38 mm. long and 7.5 mm. broad, abdominal segments of about equal width; skin smooth; general dorsal color brown to blackish, with a distinct metallic sheen.

Color dorsad of the spiracles nearly uniform throughout (a pale brown overlaid closely with dark flecks) with traces of a segmental series of darker mid-dorsal spots, a darker, indefinite subdorsal stripe forming wedge-shaped black spots on posterior segments and more or less margined ventrally by a pale, broken line and without differentiation in the supraspiracular area except that this area may be narrowly darker at the extreme ventral margin. Spiracles gray with black rims. Abruptly paler ventrad of the spiracles. A narrow orange or yellowish subventral stripe fading out ventrally. Venter closely flecked with black, pinkish and white. Setigerous tubercles minute.

Described from many live specimens. This is a one-brooded species. In the latitude of northern Tennessee the larvae begin to become mature in February and most of the larvae are in the soil for pupation by the middle of April; pupae are found in May; the moths emerge in October. Eggs deposited October 22 hatched October 28, 1927.

*Distribution.*—Kansas, Tennessee, North Carolina, Virginia, Illinois, Pennsylvania, and New York.

*Food plants.*—Clover and various weeds, also tobacco in a greenhouse.

**ANOMOGYNA Staud.**

1. Spinneret twice as long as wide or more. Third segment of labial palpus twice as long as the second segment or more.----- 2
- Spinneret, at most, but slightly longer than wide (17:14). Third segment of labial palpus but slightly longer than the second segment (5:4)----- 4
2. Spiracles white. A pale subventral stripe present. Mandible with a basal tooth on oral face.----- *clinata*
- Spiracles brown or black. Pale subventral stripe not evident.----- 3
3. Spiracles brown. Mandible without a basal tooth on oral face.----- *perqueritata*
- Spiracles black. Mandible with two basal teeth on oral face, one very broad and dentate on apical margin.----- (No. 20).
4. Frontal setae at least twice as near to lateral margin of front as to the adjacent frontal puncture. Emargination in apical margin of labrum broad and shallow, the depth less than one-sixth the length of the labrum (5:33). With a broad, clear yellow subventral stripe. Spiracles pale. One small basal tooth normally present on oral face of mandible but this often absent.----- *mustelina*

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USDA TECHNICAL BULLETINS

UPDATA

THE LARVAE OF THE PHALANIDAE

CRUMB, S. E.

2 OF 4

Frontal setae nearly equidistant between lateral margin of front and the adjacent puncture but this relationship is very deceptive to the eye and will require measurement. Emargination in anterior margin of labrum distinctly deeper, the depth equal to one-fourth the length of the labrum (8:32), or more.----- 5

5. Spinneret broader than long (18:13). Mandible with one basal tooth on oral face. Spiracles yellow or pale brown. Subventral pale stripe scarcely indicated.----- sp. (No. 21)

Spinneret slightly narrower than long (14:17). Mandible with two basal teeth on oral face, arising from different ribs. Spiracles black. A strong pale subventral stripe present.----- *dilucida*

#### A ANOMOCYNA ELIMITA (Gn.)

Head 2.5 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color green to gray.

Middorsal and subdorsal white lines strong, broken only at the incisures, and margined by black lines. A segmental series of oblique black spots arising subdorsally at anterior margin of segments and passing between setigerous tubercles I and II. A black line partially including the spiracles. Spiracles white. A distinct, pale subventral stripe extending nearly to V. Venter green. Setigerous tubercles minute. Head pale greenish brown with brownish submedian arcs and reticulation.

Described from four mature alcoholic specimens received from Dr. A. W. A. Brown and labeled "Jocko, R., Mattawa, Ont., FIS 3722 A, VI.14.41." Brown and McGuffin (6) describe this larva with figures.

*Distribution.*—United States: North Carolina, New Jersey, Pennsylvania, Connecticut, Massachusetts, New York, New Hampshire, and Maine. Canada: Nova Scotia, New Brunswick, Quebec, and Ontario.

*Food plants.*—Brown and McGuffin (6) list the food plants as white spruce, black spruce, Englemann spruce, balsam fir, hemlock, red pine, and jack pine.

#### ANOMOCYNA PERQUIRITATA (Morr.)

Head 3.4 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of about equal width throughout; skin smooth; general color gray.

Middorsal and subdorsal pale lines absent except that the middorsal line may be indicated on the thorax. Markings obscure and diffused, made up of black reticulation which may be fused to form small black spots. Aggregations of the black spots near or including setigerous tubercles I and II may outline a segmental series of vague shield-shaped dorsal figures. Spiracles brown. A large, irregular yellowish spot anterior to each spiracle. Subventral pale stripe absent. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head brown with dark brown or black submedian arcs and reticulation.

Described from one mature alcoholic larva labeled "Franquelin, Quebec, FIS 4694 C, IX.6.38, white spruce" and an immature specimen labeled "Ferme Tapini, Quebec, FIS 383 B, VI.20.40, white spruce." Both specimens received through the kindness of Dr. A. W. A. Brown. Brown and McGuffin (6) have described this larva with figures.

*Distribution.*—United States: Maine and Washington. Canada: New Brunswick, Newfoundland, Quebec, British Columbia, and Alberta.

*Food plants.*—White spruce (*Picea glauca*) and black spruce (*Picea mariana*) (teste Brown and McGuffin).

## ANOMOCYNA sp. (No. 20)

Head 2.7 mm. broad. Body too shriveled for measurement, abdominal segments apparently of equal width; skin smooth; general color probably gray.

Middorsal and subdorsal pale lines not evident. A segmental series of subdorsal black spots occupying the space between setigerous tubercles I and II. Setigerous tubercles III, IV, and the spiracles in a black spot. Spiracles black. Subventral pale stripe not evident. Head with black submedian arcs and reticulation, a large black area above antennal insertion, mandible with 2 basal teeth, one very broad and dentate on apical margin.

Described from one alcoholic specimen collected by the Quebec Entomological Service and received through the kindness of Dr. A. W. A. Brown. The specimen is labeled "No. 25, St. 265, Zone 119, epinard blanche, R. I. F. 16439-C, June 7, 1942," and is now in the collection of the Canadian National Museum.

*Distribution.*—Unknown.

*Food plant.*—White pine (*Pinus strobus*).

## ANOMOCYNA MUSTELINA (Sm.)

Head 2.3 to 2.5 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, tapering gradually posteriorly; skin smooth; general color rather dark purplish gray.

Middorsal line continuous, subdued white, bordered strongly with black near juncture of segments. A broken, inconspicuous white line well ventrad of setigerous tubercle II. A pale yellowish area posterior to II bordered dorsally by a purplish line. From the subdorsal white line to somewhat ventrad of III a uniform purplish stripe bordered ventrally by a dark line. Spiracles pale yellowish or white set in the dorsal margin of the clear pale yellow subventral stripe which extends to V and is margined ventrally by purplish reticulation which fades out ventrally. Midventer bluish white. Setigerous tubercles minute. Head whitish with infuscated brown to reddish submedian arcs and reticulation which are sometimes obscure.

Described from numerous live larvae collected in Washington and Oregon. An immature larva was beaten from Douglas-fir in March by W. W. Baker; larvae are mature in June and moths have emerged in July. Benjamin determined moths.

*Distribution.*—United States: Washington, Oregon, Idaho, and California. Canada: British Columbia.

*Food plants.*—Mostly on Grand fir (*Abies grandis*) and Alpine fir (*Abies lasiocarpa*), but also found on Douglas-fir (*Pseudotsuga taxifolia*) and pine.

## ANOMOCYNA sp. (No. 21)

Head 3.2 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color dark gray.

Ground color of body white reticulate with blackish. A broad, irregular pale middorsal line margined by black lines. A strong white line immediately ventrad of II interrupted at the incisures. An area of more concentrated blackish reticulation including setigerous tubercle I, extending to II and bordered laterally by a segmental series of linear black marks anterior to II. Upper half of supraspiracular area paler than the ventral half, the latter reticulate with black and paler about midway of each segment. Spiracles yellowish or pale brown. Subventral pale stripe scarcely indicated. Venter pale reticulate with black and white. Setigerous tubercles minute. Head smooth, white, with black submedian arcs and infuscated brownish reticulation.

Described from one larva beaten from pine May 30, 1932, near the Yakima River a few miles west of Cle Elum, Wash., by Wm. W. Baker. No moth was reared.

*Distribution*.—Unknown.

*Food plant*.—Lodgepole pine (*Pinus contorta*).

#### ANOMOGYNA DILUCIDA (Morr.)

Head width not recorded. Body about 35 mm. long and 4.5 mm. broad at middle, abdominal segments approximately equal in width throughout; skin smooth; general dorsal color brown.

An inconspicuous white middorsal line broken at the incisures. A broader subdorsal white line produced to include setigerous tubercle II and strongest on anterior half of segments. Bordering the subdorsal line dorsally a dark shade intensified to form dark dashes on anterior half of each abdominal segment except on 8 where the mark is subtriangular. A pair of pale spots at juncture of segments dorsally outline a segmental series of shield-shaped dark figures. Dorsal portion of supraspiracular area of dorsal coloration, ventral third occupied by a continuous dark stripe partially including the spiracles. Spiracles black. A broad, distinct white subventral stripe with V at ventral margin and somewhat marked medially with reddish. Venter of dilute dorsal coloration but more reddish, an ill-defined dark stripe laterally with V in dorsal margin. Setigerous tubercles minute. Head apparently brown, markings indeterminate.

Described from 1 mature and 1 immature inflated specimen in the U. S. National Museum collected at Mer Bleue near Ottawa, Canada, by C. H. Young, June 1, 1903.

*Distribution*.—United States: New Jersey, Pennsylvania, Connecticut, Massachusetts, New Hampshire, New York, and Maine. Canada: New Brunswick, Newfoundland, and Ontario. Moths have also been reported from California and British Columbia.

*Food plants*.—American larch (*Larix americana*) and black spruce (*Picea nigra*).

#### OCHROPLEURA Hbn.

##### OCHROPLEURA PLECTA (L.)

Head 2.65 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, abdominal segments of approximately equal width throughout, a slight dorsal hump on 8, 9 strongly declivous; skin smooth; general color dark brown.

Coloration to and including the spiracles made up of a blackish reticulation, which tends to form longitudinal strands, on a pale ground. Middorsal white line somewhat stronger toward posterior margin of abdominal segments, bordered by strong, narrow, dark lines which together form a narrow middorsal stripe. A white, much broken line somewhat ventrad of setigerous tubercle II bordered by dark lines. Dark coloration somewhat intensified posterior to II without forming definite dark dashes. Dorsal third of supraspiracular area obscurely paler than the ventral portion. A dark line in the line of the spiracles, broadened at the spiracles. Spiracles pearl gray or white. A sharply defined yellowish subventral stripe strongly reticulate with pink, extending to setigerous tubercle V and bordered ventrally by a definite dark stripe extending nearly to VI. Remainder of venter pale, reticulate with black. Shields of prolegs black. Setigerous tubercles minute. Head pale with dark brown or black submedian arcs and reticulation, a large pale area above antennal insertion.

Described from eight live larvae collected in Washington. Larvae are mature in September and moths emerge in April and May of the following year. Probably there is a second brood. Moths determined by Clarke.

*Distribution*.—Occurs in the north across the United States, in the adjacent Provinces of Canada, and in Alaska. The United States rec-

ords include: District of Columbia, New Jersey, Pennsylvania, Ohio, Illinois, Wisconsin, Massachusetts, New Hampshire, New York, Maine, South Dakota, Montana, Idaho, and Washington. Moths have also been reported from Arizona and Texas.

*Food plants.*—Larvae have been beaten from willow at night and this probably is their preferred food, but specimens have been taken several times in wet places under thick growths of *Aster* which had become matted on the ground.

#### DIARSIA Hbn.

With a segmental series of black subdorsal dashes anterior to II becoming triangular on 8 where they are joined posteriorly. A segmental series of pale triangles arising ventro-anterior to II including this tubercle and extending dorso-posteriorly upon the following segment. A diffuse black mark arising ventrad of IV, including the spiracle and extending obliquely dorso-anteriorly upon the preceding segment.----- *csurialis*

With a black, continuous subdorsal line usually intensified anterior to II, the lines not joined posteriorly on 8. Pale triangles including II absent. Oblique black mark including the spiracles absent.----- *rosaria*

#### DIARSIA ESURIALIS (Grt.)

Head 2 to 2.2 mm. broad. Body 32 mm. long and 4.5 mm. broad at middle, abdominal segments 7 and 8 somewhat broadened; skin smooth; general color a warm brown.

Dorsum uniform infuscated brown excepting a segmental series of pinkish brown triangles arising ventrad of setigerous tubercles II and extending dorso-posteriorly upon the following segment, partially bordered ventrally by a segmental series of black dashes on anterior half of abdominal segments obsolete anteriorly, becoming wedge-shaped on abdominal segments 7 and 8 and obscurely joined across the dorsum on 8 where they are margined posteriorly by a pale bar. A broken, indistinct subdorsal white or yellowish line. Supraspiracular area nearly uniform sordid blackish, the dark coloration somewhat intensified in an obscure stripe arising between the spiracle and setigerous tubercle III and extending dorso-anteriorly upon the preceding segment. Spiracles black or deep infuscated brown. Subventral pale stripe faintly indicated. Venter infuscated, flecked with white and tinged with orange brown. Setigerous tubercles minute. Head brown with dark submedian arcs and reticulation, the reticulation sometimes sparse, a white spot above antennal insertion extending posteriorly as a pale brownish area.

Described from five larvae. Larvae have been collected in April, May, and September and moths have emerged in May, June, and (indoors) in November. Moths determined by Benjamin.

*Distribution.*—United States: California, Oregon, Washington, and Alaska. Canada: British Columbia.

*Food plants.*—Alder and hazel.

#### DIARSIA ROSARIA (Grt.)

Head 2.5 to 2.6 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color varying from a warm brown to dusky gray depending on the degree of infuscation.

Dorsal area, including setigerous tubercle II, sharply defined, pale gray or brownish. Middorsal pale line more distinct on posterior half of segments and strongly outlined with black. A narrow black stripe at lateral margin of dorsal area, usually more intense on anterior half of segments. Ventrad of this to the spiracles the dark coloration becomes gradually more dilute. Spiracles brown. Traces of a pale subventral stripe present. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head coloration distinctive: Front and

a wide adjacent area clear black margined laterally by a narrow, conspicuous white area arising above base of antenna and extending posteriorly to include setigerous tubercle P<sup>1</sup>, and with black reticulation laterally.

Described from many larvae. Larvae begin to become mature in March and moths have emerged in April. Moths determined by McDunnough.

*Distribution.*—United States: California, Oregon, Idaho, Washington, and Montana; Alaska. Canada: British Columbia and Alberta.

*Food plants.*—Feeds primarily on grasses but also on *Geum* and strawberry.

#### PSEUDOSPÆLOTIS\* McD.

##### PSEUDOSPÆLOTIS HARUSPICA (Grt.)

Head 3 to 3.4 mm. broad. Body about 35 to 40 mm. long and 5 mm. broad at middle, abdominal segments 7 and 8 slightly broadened; skin smooth; general color pale gray to blackish often with a purplish tinge, especially ventrally.

Middorsal and subdorsal pale lines obsolete or but faintly indicated. No dark markings anterior to setigerous tubercle II except sometimes on abdominal segment 7. A black transverse bar posterior to II on 8. A segmental series of obscure, narrow, somewhat convergent pale marks posterior to II which do not outline definite dark dorsal figures. A narrow, sinuous black stripe including the spiracles. Spiracles varying in color from yellowish to a decided brown. A sharply defined but subdued pale subventral stripe reticulate with whitish and tinged with purplish. Venter sordid pale, reticulate with white and tinged with purplish. Setigerous tubercles minute. Head white with strong black submedian arcs and full black reticulation.

Described from numerous live larvae collected in Washington. Larvae are mature in April and May and moths have emerged from May to July. Moths determined by Benjamin and by McDunnough, as *sierrae* Harv.

*Distribution.*—Occurs in the North across the United States, in all the adjacent Provinces of Canada, and in Alaska. The United States records include: North Carolina, Pennsylvania, Connecticut, Massachusetts, New York, New Hampshire, Maine, California, New Mexico, Utah, Colorado, Oregon, Washington, Idaho, Montana, North Dakota, and South Dakota.

*Food plants.*—Larvae have been collected at night by beating willow, Indian-plum or osoberry (*Osmaronia cerasiformis*), hardhack (*Holodiscus discolor*), and salmonberry (*Rubus spectabilis*), and are also known to feed on stinging-nettle (*Urtica lyalli*) and strawberry.

#### GENUS No. 5

Spiracles white..... "*Rhynchagrotis*" *exsertistigma*  
Spiracles dark brown..... "*Rhynchagrotis*" *insularis*

##### "RHYNCHAGROTIS" INSULARIS Grt.

Head 3 to 3.2 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, abdominal segments tapering somewhat posteriorly; skin smooth; general color blackish, the dorsum paler posteriorly.

A broad, continuous pale middorsal line. A narrower, continuous pale line well ventrad of setigerous tubercle II, partially margined dorsally by a segmental series of black dashes on anterior half of abdominal segments which become

\*See comments, p. 3.

wedge-shaped on abdominal segments 7 and 8 and are followed by a pale area on each abdominal segment. Supraspiracular area to and including the spiracles blackish, the dark color somewhat intensified toward the spiracles. Spiracles dark brown. A broad, pale, subventral stripe extending to setigerous tubercle V. Venter to base of prolegs dark, paler midventrally. Setigerous tubercles minute. Head brown with black submedian arcs and reticulation, a whitish area arising above antennal insertion.

Described from many larvae collected in Washington. The winter is spent as larvae and these begin to pupate in March, most of the larvae being in the soil by the last of April. Moths have emerged in May. Moths determined by McDunnough.

*Distribution.*—United States: California, Oregon, Washington, and Montana. Canada: British Columbia.

*Food plants.*—Various grasses.

### "RHYNCHAGROTIS" EXSERTISTICMA (Morr.)

Head 2.6 to 2.8 mm. Body about 30 mm. long and 4.5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color light gray.

A broad, unbroken middorsal white line margined by dark lines. A narrower, unbroken pale line ventrad of setigerous tubercle II, partially margined dorsally by a segmental series of black dashes on anterior half of abdominal segments, becoming wedge-shaped on 7 and 8. A narrower indefinite stripe tinged with brownish at dorsal margin of the supraspiracular area which, otherwise, is reticulate with black to and including the spiracles. Spiracles white. A strong white subventral stripe reaching V and margined ventrally by a definite narrow dark stripe with VI in ventral margin. Venter much flecked with white. Setigerous tubercles minute. Head white with black submedian arcs and a mixture of dark and ferruginous reticulation.

Described from eight larvae collected in Washington. Larvae were mature in March and April and moths emerged in May. Moths determined by Benjamin.

*Distribution.*—United States: California, Nevada, Utah, Oregon, Washington, and Montana. Canada: British Columbia.

*Food plants.*—Various grasses.

### SETAGROTIS Sm.

Third segment of labial palpus twice as long as the second segment. Without spinules or denticles on apical margin of spinneret. Spiracles white. Subventral pale stripe parallel-margined. *planifrons*

Second and third segments of labial palpus of equal length. With spinules or denticles on anterior margin of spinneret. Spiracles dull brown. Subventral pale stripe extremely sinuate on dorsal margin, straight on ventral margin. *piscipallus*

### SETAGROTIS PLANIFRONS (Sm.)

Head 2.7 mm. broad. Body about 33 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color brownish.

Coloration made up of a blackish reticulation on a yellowish brown ground. Dorsum paler than the supraspiracular area. Middorsal pale line broken, inconspicuous, stronger near posterior margin of each abdominal segment, strongly margined by black lines, the two black lines giving the appearance of a narrow middorsal black stripe. Disc of dorsum unicolorous. A segmental series of dark markings anterior to setigerous tubercle II, linear throughout and bordered ventrally by an inconspicuous, broken pale line. Supraspiracular area uniform in color except in a narrow dark stripe on ventral margin, including the spiracles, and narrowed at juncture of segments. Spiracles white. A distinct subventral

stripe of white reticulation tinged faintly with pink. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head pale brownish with black submedian arcs and reticulation.

Described from four larvae collected in Washington. From larvae collected in April and May a moth emerged VI.11.33 and was determined by Benjamin.

*Distribution*.—United States: Idaho, Washington, and Montana. Canada: British Columbia.

*Food plants*.—Alder and serviceberry (*Amelanchier florida*).

#### SETACROTIS PISCIPELLIS (Grt.)

The specimen measured may be immature. Head 2.4 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, abdominal segments of equal width throughout; skin smooth; general color dark.

A strong, white middorsal line broken at the incisures. A slightly less strong white line immediately ventrad of setigerous tubercle II giving off a very short branch including this tubercle. On thorax and abdomen a segmental series of middorsal shield-shaped figures, black anterior to II, brownish medially. A transverse white bar posterior to II on 8. A middorsal area on 9 reticulate with black and surrounded by a white line. Supraspiracular area tinged with brown, black and extremely sinuate on ventral margin with the spiracles included in the ventral loops. Spiracles dull brown. Subventral pale stripe extending to V, extremely sinuous on dorsal margin, reticulate with purplish with margining white lines, entirely severed on 7 by a strong, distinct loop of the dark dorsal coloration including IV. Setigerous tubercles minute. Head suffused with dilute brown with diffuse, obscure brown submedian arcs and pinkish reticulation.

The larva of this species and that of *Andropolia diversilineata* furnish an interesting case in which an intricate, unusual color pattern is shared, in closely similar detail, by two species not at all closely related. Both species feed exclusively on antelope-brush; their distribution is nearly coterminous and both feed at night, concealing themselves on the ground during the day.

Several species of Phalaenid larvae habitually feed on antelope-brush at night at the same season and numerous species are found on the ground about the plants during the day but none of these shows a tendency toward the type of coloration found in the "mimic" species. It seems difficult to conceive any advantage either of the species gains through this twin resemblance. A similar case involves *Aseptis adnixa* and *Adelphagrotis stellaris*.

Described from three larvae collected in Washington June 8, 1940. A moth emerged July 28, 1940, and was determined by Clarke.

*Distribution*.—United States: Arizona, California, Nevada, Utah, Colorado, Wyoming, Washington, and Montana. Canada: British Columbia.

*Food plant*.—Antelope-brush (*Kunzia tridentata*).

#### HEPTAGROTIS McD.

##### HEPTAGROTIS PHYLLOPHORA (Grt.)

Head 3 to 3.3 mm. broad. Body about 35 mm. long and 6.5 mm. broad at middle, abdominal segments 7 and 8 broadened; skin smooth with a metallic sheen; general color reddish brown.

Coloration made up of fuscous or black flecks on a reddish brown ground. A broad, continuous middorsal pale line, strongly margined with blackish and extending across the anal shield. Dark flecks concentrated dorsally and thinning out toward the spiracles, fused to form definite spots dorsad of setigerous

tubercles I and II. No trace of a subdorsal pale line ventrad of II or of a segmental series of subdorsal dark markings. Oblique pale triangles indicated posterior to II. Spiracles black. Subventral pale stripe not evident in alcoholic specimens. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head a decided brown with darker brown submedian arcs and reticulation.

Described from three alcoholic specimens received from J. H. Hawkins and labeled, "Brunswick, Me., V.3.29, Blueberry." Phipps (36) gives an account of this species, including a figure of the larva, from which the following outline of the seasonal history is taken. Seventy-nine larvae were all in the last instar when collected April 30, 1939; all had pupated by May 12, and 69 moths emerged between May 27 and May 29. Eggs deposited June 8, 1930, hatched June 16.

*Distribution.*—From New Jersey, Pennsylvania, New York, Connecticut, Massachusetts, New Hampshire, Maine, and Wisconsin, northward.

*Food plants.*—Phipps states that wild cherry seems to be the preferred food plant, but that the larva accepts alder, birch, blueberry, *Spiraea*, *Viburnum*, and willow.

#### EUROIS Hbn.

Cervical shield infuscated brown with three orange lines-----*occulta*  
Cervical shield a clear, warm orange brown with faint lines or none-----*stricta*

#### EUROIS OCCULTA (L.)

Head 3.4 mm. broad. Body about 55 mm. long and 9 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color blackish.

Body tinged with purplish throughout. Middorsal pale line very slender, more distinct on posterior half of segments. A segmental series of black subdorsal spots becoming wedge-shaped on abdominal segments 7 and 8, joined posteriorly on 8 and bordered posteriorly on this segment by a transverse white line, all bordered ventrally by a slender, inconspicuous, yellow line broadly broken at the incisures. A disconnected series of black spots including the spiracles, broadened to anterior margin of each segment and bordered ventrally by a yellow line. Spiracles entirely black. A subdued subventral pale stripe reticulate with black and tinged with orange at the spiracles. Venter reticulate with black to base of prolegs, obscurely purplish reticulate with white medially. Cervical shield and anal shield infuscated brown with three orange lines. Setigerous tubercles minute. Head pale with strong black submedian arcs and reticulation, the reticulation becoming purple at margin of pale area above antennal insertion and pinkish posterior to the ocelli.

Described from two larvae swept at night May 25, 1939, at Pleasant Valley Camp, Highway 410, Mount Rainier National Forest; two alcoholic larvae labeled, "Holden, Maine, May 20, 1920, J. H. Hawkins coll." and one alcoholic larva labeled, "Brunswick, Maine, May 19, 1929, J. H. Hawkins coll." Phipps (36) gives a brief account of this species with figures.

*Distribution.*—Occurs in the North across the entire United States and in the adjacent Provinces of Canada. The United States records include: Washington, Montana, Colorado, New Jersey, Pennsylvania, New York, Massachusetts, New Hampshire, and Maine.

*Food plants.*—Larvae have been swept from snowberry (*Symphoricarpos* sp.) and larkspur at night, and Phipps (36) records blueberry (*Vaccinium* spp.) and maple as food plants.

## EUROIS ASTRICTA Morr.

Head 4.1 to 4.2 mm. broad. Body about 50 mm. long and 8 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color blackish.

Coloration to the spiracles blackish with a distinct purplish tinge and the dorsum faintly brownish. Middorsal pale line slender or absent, tending to be more distinct on posterior half of segments. A segmental series of subdorsal black dashes, definitely triangular on abdominal segments 7 and 8, joined across the dorsum on 8 and bordered ventrally by a strong bright yellow line widely broken at the incisures. A sinuous black line in the line of the spiracles, strongly broadened anterior to them and bordered ventrally by a yellow or orange line. Spiracles entirely black. A subdorsal purplish white subventral stripe reticulate with brownish purple. Venter dusky purplish reticulate with white. Cervical shield and anal shield clear orange-brown, cervical shield black on anterior margin. Setigerous tubercles minute. Head purplish with black submedian arcs, the reticulation purplish brown becoming pinkish posterior to the ocelli.

Described from five larvae swept at night May 25, 1939, at Pleasant Valley Forest Camp, Highway 410, Mount Rainier National Forest; two inflated larvae "Kaslo Cr., B. C., No. 1334, H. G. Dyar coll." from U. S. National Museum and five alcoholic specimens "Brunswick, Maine, May 19, 1930" received through the kindness of J. H. Hawkins. Phipps (36) gives a brief account of this species with figures. Moths determined by Clarke.

*Distribution*.—Occurs in the north entirely across the United States, in the adjacent Provinces of Canada, and in Alaska. The United States records include: Utah, Colorado, Wyoming, Washington, Montana, Wisconsin, Minnesota, New York, Massachusetts, New Hampshire, and Maine.

*Food plants*.—Some of the specimens collected at Pleasant Valley Forest Camp were feeding on *Mertensia*. Phipps (36) lists alder, birch, blueberry, wild cherry, maple, meadow-sweet (*Spiraea latifolia*), wild strawberry, and *Viburnum* as food plants.

## GRAPHIPHORA \*Ochs.

(And "ANOMOCYNA" INFIMATIS)

1. Third segment of labial palpus at least twice as long as second segment or with denticles or spinules on apical margin of spinneret. Setigerous tubercles minute, mere setal insertions.----- 2
- Third segment of labial palpus, at most, but slightly longer than second segment (4:3) Apical margin of spinneret without spinules or denticles. Dorsal setae in small, flat, black tubercles.----- 6
2. Pale line ventrad of setigerous tubercle II giving off a short arm nearly or quite including this tubercle. Spinneret longer than broad. Third segment of labial palpus twice as long as second segment or more. Ocelli III and IV one-fourth the width of III apart (5:18) or more (8:15)----- 5
- Pale line ventrad of II not giving off an arm including this tubercle. Spinneret usually broader than long. Comparative length of second and third segments of labial palpus variable. Ocelli III and IV one-fifth the width of III apart (3:15) or less (1:18)----- 3
3. Spiracles black. A segmental series of triangular black subdorsal markings tending to appear on all abdominal segments. Large, oblique black spots including the spiracles. Third segment of labial palpus no longer than second segment.----- *Graphiphora badinodis*
- Spiracles pale or brown. Black subdorsal markings obsolete anteriorly and tending to become triangular on abdominal segments 7 and 8 only. Black spots absent at spiracles or very small.----- 4

\*See comments, p. 3.

4. Combined length of second and third segments of labial palpus equal to distinctly more than one-half the length of the basal segment (9:13). Mandible without a basal tooth on oral face. Third segment of labial palpus twice as long as second segment or more..... "*Anomogyne*" *infimatis*
- Combined length of second and third segments of labial palpus equal to one-half length of basal segment or less (6:12). Mandible normally with a basal tooth on oral face but this often absent. Relative lengths of second and third segments of labial palpus variable..... *Graphiphora c-nigrum*
5. Head a decided brown, setigerous tubercles P<sup>1</sup> and P<sup>2</sup> in small black spots, reticulation brown to reddish. Mandible with but one basal tooth on oral face..... *Graphiphora smithi*
- Head pale brown, setigerous tubercles P<sup>1</sup> and P<sup>2</sup> not in black spots, reticulation black. Mandible with two small basal teeth set close together on oral face..... *Graphiphora normaniana*
6. With a segmental series of broadly connected, ovoid, dark middorsal figures. Head with black submedian arcs strong on occiput, the dark reticulation very distinct. Mandible with a blunt basal tooth without a molar area. Gorge of hypopharynx bearing spinules nearly to posterior end.  
*Graphiphora bicarnea*
- With a dark stripe including the middorsal pale line. Black submedian arcs fading out on the occiput, the reticulation infuscated brown and very faint. Mandible with an angular basal tooth on oral face, bearing a narrow molar area. Gorge of hypopharynx without spinules except at extreme anterior end..... *Graphiphora flavotincta*

#### GRAPHIPHORA BADINODIS (Gr.)

Head 2.5 to 2.7 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color dark gray.

A pale, inconspicuous middorsal line. Dorsal area nearly uniform in color excepting a segmental series of black spots anterior to setigerous tubercle II present and subtriangular throughout on abdominal segments 1 to 3 and bordered ventrally by the yellowish subdorsal line. Supraspiracular area uniform in color excepting a segmental series of large, oblique black spots above the spiracles. Spiracles black. Body abruptly paler ventrad of the spiracles, with a subdorsal subventral pale stripe. Dorsal setigerous tubercles minute, ventral tubercles small but more than setal insertions. Head pale brown with heavy black submedian arcs and black to ferruginous reticulation.

Described from many larvae collected in Tennessee. This is a one-brooded species. The winter is passed as larvae nearly all of which have entered the soil for pupation by the last of April. After a pupal stage of more than 4 months, moths begin to emerge the last of September and emergence is completed by the third week in October. Dyar determined moths. Crumb (19) gives an account of this species with figures.

*Distribution.*—Texas, Kansas, Nebraska, Iowa, Illinois, Minnesota, Tennessee, North Carolina, Virginia, Maryland, Pennsylvania, Ohio, Connecticut, Massachusetts, New York, and New Hampshire.

*Food plants.*—Clover, dock (*Rumex crispus*), hedge-mustard (*Sisymbrium officinale*), chickweed (*Stellaria*), *Aster ericoides*, and tobacco. This larva shows a decided preference for *Rumex* and chickweed.

#### "ANOMOCYNA" INFIMATIS (Gr.)

Head 2.4 to 2.6 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, with abdominal segments 7 and 8 slightly broadened; skin smooth; general color varying from light gray to the more usual brown.

Faint, broken pale lines middorsally and slightly ventrad of setigerous tubercle II. A segmental series of shield-shaped dark dorsal figures may be indicated, especially on posterior segments, or these may be absent. A segmental series of

black marks anterior to II, linear anteriorly and wedge-shaped on abdominal segments 7 and 8, may be present or may be reduced to the spots on 8 which are connected by a transverse black bar. A few black flecks in the supraspiracular area. Spiracles varying in color from pale yellowish to brown. Dorsal margin of subventral pale stripe represented by a strong white line ventrad of the spiracles, the stripe usually ill-defined elsewhere. Venter pale with white flecks. Setigerous tubercles minute. Head pale or pale brownish with conspicuous black submedian arcs, the reticulation black, infuscated brown, reddish or absent.

Described from many larvae collected in Washington. Larvae become mature in April and May, spend several weeks in thin, hard, earthen cells before pupation, and moths emerge in July and August. Benjamin determined moths, some of which were of variety *vernarius* Sm.

*Distribution.*—United States: New Mexico, Colorado, Utah, California, Oregon, Washington, and Montana. Canada: British Columbia.

*Food plants.*—Serviceberry (*Amelanchier florida*), alder, false-hellebore (*Veratrum californicum*), and *Eriogonum* sp.

#### GRAPHIPHORA C-NIGRUM (L.)

Head 2.7 to 3 mm. broad. Body about 35 mm. long and 4.5 to 6.5 mm. broad, abdominal segments of about equal width throughout; skin smooth; general color varying from brown to drab gray, brown predominating in Washington and gray in Tennessee.

Middorsal pale line and that ventrad of setigerous tubercle II much broken, inconspicuous. A segmental series of dorsal figures sometimes indicated. A segmental series of black marks anterior to II, linear and more or less obsolete on anterior abdominal segments and becoming wedge-shaped on 7 and 8. Supraspiracular area usually somewhat paler dorsally and sometimes tinged with brown or orange, the ventral margin with the darker coloration somewhat intensified without forming segmental spots. Spiracles white or yellowish. A broad, subdued, subventral pale stripe sometimes tinged with pinkish or orange. Setigerous tubercles minute. Head white or pale brown with black submedian arcs and black to ferruginous reticulation.

Described from many live specimens. Apparently this is a three-brooded species in northern Tennessee, the winter usually being spent as nearly mature larvae. Dyar, Benjamin, and Clarke have determined moths. Crumb (19) gives an account of this species with figures.

*Distribution.*—Occurs generally throughout the more northern United States, the adjacent Provinces of Canada, and in Alaska, with the southern boundaries of North Carolina, Tennessee, Missouri, Kansas, Colorado, and Utah marking approximately the southern limit of its range.

*Food plants.*—A very general feeder on orchard, garden, and field crops.

#### GRAPHIPHORA SMITHI (Snell.)

Head 2.5 to 2.7 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color usually brown varying to gray.

Middorsal pale line almost obsolete. A segmental series of brown or blackish shield-shaped markings dorsally on abdominal segments, bordered laterally by a strong, distinct subdorsal white line which gives off a short branch anterior to II which nearly or quite includes this tubercle. Supraspiracular area of dorsal color becoming gradually more dilute to the spiracles. Spiracles pale yellowish to brown. The rather indefinite pale subventral stripe sometimes tinged with pinkish. Venter pale much flecked with white. Setigerous tubercles minute. Head a bright brown with black submedian arcs, sometimes obsolete anteriorly, and slender pinkish to reddish reticulation.

Described from many live larvae collected in Washington. Larvae begin to become mature in April and nearly all have entered the soil for pupation by the middle of May. Moths emerge in June and July. McDunnough determined moths.

*Distribution.*—Occurs rather generally in the United States north of the latitude of the Ohio River, in all the adjacent Provinces of Canada, and in Alaska. The United States records include: Arizona, Utah, Colorado, Oregon, Washington, Montana, Illinois, Minnesota, Wisconsin, Maryland, New Jersey, Pennsylvania, Connecticut, Massachusetts, New York, and Maine.

*Food plants.*—Cultivated raspberry, thimbleberry (*Rubus parviflorus*), salmonberry (*Rubus spectabilis*), strawberry, apple, alder, false-hellebore (*Veratrum californicum*), violet, and dock (*Rumex*). P. M. Eide, of the Northwestern Washington Experiment Station, submitted specimens of this larva stating that they were causing serious damage to strawberry in the area about Monroe, Wash. This is the first report of serious injury caused by this species that has come to the attention of the writer.

#### GRAPHIPHORA NORMANIANA (Gr.)

Head 2.6 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color brown.

Coloration to and including the spiracles brownish overlaid with rather uniform dark reticulation. Middorsal pale line nearly obsolete. The faint pale line ventrad of setigerous tubercle II giving off a short branch including this tubercle. A segmental series of ovoid dark middorsal figures sometimes present, more evident posteriorly. Coloration intensified anterior to II to form faint, linear dark spots. No intensification of the dark coloration in the line of the spiracles. Spiracles very small, apparently brown. No subventral pale stripe apparent in the material at hand. Setigerous tubercles minute. Head brown with strong black submedian arcs and reticulation.

Described from four alcoholic larvae labeled "Brunswick, Me., May 10, 1930," and received through the kindness of J. H. Hawkins.

*Distribution.*—United States: North Carolina, Maryland, New Jersey, Pennsylvania, Connecticut, Massachusetts, New York, New Hampshire, Maine, Wisconsin, Minnesota, South Dakota, Colorado, and Arizona. Canada: Alberta, Manitoba, Ontario, Quebec, and Nova Scotia.

*Food plants.*—Phipps (36) lists blueberry (*Vaccinium* spp.), wild cherry, meadowsweet (*Spiraea latifolia*), wild raspberry, and sweet-fern (*Myrica*) as food plants.

#### GRAPHIPHORA BICARNEA (Gr.)

Head 3 to 3.1 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color pale brown to infuscated brown.

A strong, continuous middorsal pale line. A segmental series of broadly connected ovoid dark middorsal markings. A pale longitudinal stripe between setigerous tubercles I and II bordered ventrally by a dark line immediately ventrad of II the color of which is intensified to form black dashes anteriorly on some posterior abdominal segments. This line bordered ventrally by a strong pale line margined ventrally by a slender dark line. Supraspiracular area to but not including III pale with dark flecks. Including III and the spiracles a dark stripe tending to be less strong at juncture of segments and bordered ventrally by a white line at the dorsal margin of the pale subventral stripe. Spiracles pale

but probably variable in color as in *flavotincta*. Setigerous tubercles small but more than mere setal insertions, flat, conspicuous black. Head pale with strong black submedian arcs and reticulation.

Described from six alcoholic larvae labeled "North Sedgwick, Me., Aug. 10, 1930" received through J. H. Hawkins and 8 inflated and 5 alcoholic specimens in the U. S. National Museum. Phipps (36) gives a brief account of this species with figures.

*Distribution*.—Occurs in the northeastern United States and the adjacent Provinces of Canada. The United States records include: Iowa, Illinois, Minnesota, Wisconsin, Ohio, North Carolina, Maryland, New Jersey, Pennsylvania, Connecticut, Massachusetts, New York, and Maine.

*Food plants*.—Phipps (36) records blueberry (*Vaccinium* spp.), gray birch, dandelion, maple, and meadowsweet (*Spiraea latifolia*) as food plants.

#### GRAPHIPHORA FLAVOTINCTA (Sm.)

Head 3 to 3.3 mm. broad. Body about 34 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color pale gray to brownish gray, sometimes tinged with green.

A strong, continuous middorsal pale line bordered by a dark stripe with setigerous tubercle I in its outer margin. A pale stripe between I and II. Setigerous tubercle II in a dark line intensified to form black dashes anteriorly on some posterior abdominal segments. Bordering this dark line ventrally a sharply defined white stripe tinged with yellowish. Supraspiracular area to but not including III pale, tinged with dilute orange. A dark stripe including III and the spiracles. Spiracles varying from pale gray to pale brown. A broad, sharply defined subventral stripe pale, tinged with yellowish and paler at the margins. Venter pale flecked with white. Setigerous tubercles small but more than mere setal insertions, flat, conspicuous black. Head pale brownish with conspicuous black submedian arcs, fading out on the occiput, and very faint infuscated brown reticulation.

Described from numerous specimens. Larvae become mature in April and moths emerge in June. This larva bears a close resemblance to some species of *Leucamia*. McDunnough determined moths.

*Distribution*.—Canada: British Columbia; United States: Washington and Utah; also Alaska.

*Food plants*.—This is essentially a grass-feeding species, but has fed upon various other plants in confinement.

#### PRONOCTUA Sm.

##### PRONOCTUA PYROPHILOIDES (Harv.)

Head 2.4 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, somewhat broadened on abdominal segments 7 and 8; skin smooth; general color dark gray.

Distinctly mottled dorsally with ill-defined pale and dark spots, without definite markings. Middorsal pale line absent, the middorsal line dark at juncture of segments. Two indefinite middorsal pale spots on each abdominal segment and an indefinite pale area posterior to setigerous tubercle II. No subdorsal dark markings. Subdorsal pale line absent. A diffuse pale spot surrounding setigerous tubercle III and another dorsal of IV. Spiracles in inconspicuous dark spots which, if joined, would form a sinuous dark spiracular stripe. Spiracles white. Subventral pale stripe absent. Venter of dilute dorsal coloration becoming gradually paler midventrally. Setigerous tubercles minute. Head brown with black submedian arcs and black to brownish reticulation.

Described from one larva collected in Washington, April 20, 1935, a few hundred feet east of Virden school on the old road to Ellensburg

at a spot where a peculiar species of clover grows. This larva pupated April 28, 1935, and the moth emerged May 27, 1935. Moth determined by Benjamin.

*Distribution.*—United States: Arizona, California, Nevada, Utah, Washington, and Montana. Canada: British Columbia.

*Food plant.*—The one specimen seen was collected beside a stone among herbage which included clover, *Balsamorhiza*, and grass, and was reared on clover.

### ANAPLECTOIDES McD.

Head of mature larva 2.3 to 2.6 mm. broad.....*pressus*  
Head of mature larva 3.2 to 3.5 mm. broad.....*prasina*

### ANAPLECTOIDES PRESSUS (Grt.)

Head 2.3 to 2.6 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, abdominal segments of approximately equal width except 7 and 8 slightly broadened; skin smooth; general color pale brownish with dark segmental markings dorsally.

Middorsal pale line strong, broken only at the incisures and crossing the segmental series of black shield-shaped dorsal figures which enclose a diffuse pale area between setigerous tubercles I. An ill-defined pale line immediately ventrad of setigerous tubercle II. Supraspiracular area reticulate with diffuse black intensified at ventral margin to form a sinuous black line broadened to form a segmental series of black spots partially including the spiracles and extending obliquely dorso-anteriorly to the anterior margin of the segments. Spiracles white. A subdued but definite subventral pale stripe reticulate with purplish. Venter pale, flecked with black and tinged with purple. Setigerous tubercles minute. Head very pale brown with black submedian arcs and reticulation.

Described from seven larvae swept at night May 25, 1939, from vegetation at margin of meadow in Pleasant Valley Forest Camp on Highway 410 in Rainier National Forest. Several of the larvae were mature at this time and 3 moths emerged between June 26 and July 1. Clarke determined moths.

*Distribution.*—Occurs somewhat generally well to the northward in the United States, in all of the adjacent Provinces of Canada, and in Alaska. The United States records include: Washington, Montana, Minnesota, Wisconsin, Pennsylvania, New York, New Hampshire, and Maine.

*Food plant.*—Corns salad (*Valerianella* sp.) was common where the collection was made and larvae were reared on this plant.

### ANAPLECTOIDES PRASINA (Denis & Schiff.)

Head 3.2 to 3.5 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color dark gray.

A distinct middorsal pale line broken only at the incisures and crossing the segmental series of dark dorsal figures which are pale medially. Subdorsal pale line ventrad of setigerous tubercle II absent or but faintly indicated. Supraspiracular area nearly uniform except in a sinuous black line at ventrad margin, broadened to form spots anterior to the spiracles. Spiracles whitish. A distinct white subventral stripe ventrad of which the body is splotted with black to base of prolegs. Setigerous tubercles minute. Head pale brown with black submedian arcs and reticulation.

Described from numerous larvae collected in Washington. The winter is passed as immature, brown larvae which begin to become

mature in February and moths have emerged in May. Clarke determined moths.

*Distribution.*—Occurs in the North generally across the United States and in the adjacent Provinces of Canada. The United States records include: Washington, Oregon, Utah, Colorado, Montana, Iowa, Wisconsin, New Jersey, Pennsylvania, New York, Connecticut, Massachusetts, New Hampshire, and Maine.

*Food plants.*—The evidence seems to indicate that larvae of this species are general feeders. They have been beaten in the spring from bunches of leaves lodged overwinter several feet above the ground among the branches of huckleberry (*Vaccinium*), hazel, and maple, and are often beaten from dead brake (*Pteris*) late in the fall. They are often found on the ground among permanently drifted deciduous forest leaves where herbaceous seedlings occur; a larva has been taken feeding on foxglove (*Digitalis*) and larvae have been reared to maturity on low herbs.

### GENUS No. 6

#### "PROTOLAMPRA" BRUNNEICOLLIS (Grt.)

Head 2.7 to 3 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color of dorsum dark gray.

A strong pale middorsal line. A segmental series of black dashes on abdominal segments anterior to setigerous tubercle II showing no tendency to become wedge shaped on posterior segments, present throughout except obsolescent on 8. A somewhat oblique pale area posterior to each black dash. Bordering the black dashes ventrally a pale yellowish line margined by dark lines. Supraspiracular area pale yellowish flecked with black on somewhat less than the dorsal half, remainder to and including most of the spiracles, black. Spiracles white. A distinct white subventral stripe flecked with black. Venter of dilute dorsal coloration, thinning out midventrally. Setigerous tubercles minute. Head pale grayish brown with the strong submedian arcs and close reticulation infuscated brown.

Described from about 25 larvae collected in Tennessee. The winter is spent in the larval stage, these become mature in March and April, and moths have emerged in May. Moths determined by McDunnough.

*Distribution.*—Colorado, Kansas, Nebraska, Iowa, Wisconsin, North Carolina, Tennessee, Kentucky, Virginia, Ohio, Pennsylvania, New York, Massachusetts, New Hampshire, and Maine. This species is said to occur in Canada but we have no Canadian records.

*Food plants.*—We have reared larvae on low herbs and Phipps (36) records blueberry (*Vaccinium*), dandelion, and sweetfern (*Myrica*) as food plants.

#### HEMIGRAPHIPHORA McD.

#### HEMIGRAPHIPHORA PLEBEIA (Sm.)

Head 2.7 to 3 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width except that 8 is slightly broadened; skin smooth; general color varying from very pale gray through dark gray and dark brown to blackish.

Dorsal coloration to and partially including the spiracles nearly uniform, made up of a dark reticulation on a pale or pale brownish yellow ground, except for intensification of the dark shade at the juncture of abdominal segments middorsally, where the pale line is interrupted, and sometimes in a sinuous dark line at the spiracles. Pale middorsal line expanded to form two indefinite, diffuse spots on each abdominal segment. Traces are present of a segmental series of

oblique subdorsal pale triangles which would tend to outline a dorsal series of dark markings but these dark markings are not distinctly developed. Dark dashes anterior to II are sometimes present on some posterior segments. Spiracles white. A white or yellowish subventral stripe present. Venter of very dilute dorsal coloration. Setigerous tubercles minute. Head pallid with black submedian arcs and reticulation.

Described from many live larvae collected in Washington. The winter is passed in the larval stage. These begin to become mature in April and are present in reduced numbers in May. Moths have emerged in June and July. Moths determined by McDunnough and by Benjamin.

*Distribution.*—United States: California, Utah, Oregon, Washington, and Montana. Canada: British Columbia.

*Food plants.*—Apple, hazel, cherry, loganberry, raspberry, thimbleberry (*Rubus parviflorus*), rhododendron, and willow.

### ADELPHAGROTIS Sm.

A subtle difference in habitus makes it possible to distinguish between *stellaris* and *indeterminata* with some confidence when live specimens of both are available for comparison, but the writer has found no definite detail of coloration or structure upon which a separation might be based. The species tentatively determined here as *quarta* apparently would have to be either *quarta* or a new species.

Subventral pale stripe sometimes distinct but usually obscure, without white spots.....*stellaris, indeterminata*  
Subventral pale stripe broadened postero-ventrad of each spiracle where it forms a conspicuous white spot.....*quarta*

### ADELPHAGROTIS STELLARIS (Gr.)

Head 2.6 to 2.7 mm. broad. Body about 30 mm. long and 6 mm. broad at middle, abdominal segments of approximately equal width throughout, with a small, distinct, rounded middorsal hump on abdominal segment 1, a slight, similar hump on 2, and a decided hump on 8; skin smooth; general color varying from soft gray to blackish.

Middorsal white line distinct and continuous or obscure. Body paler posteriorly, with an obscure segmental series of dark shield-shaped dorsal figures, pale medially, on anterior abdominal segments outlined laterally by obscurely defined areas of dark reticulation anterior to setigerous tubercle II and including I. Strong black spots anterior to II on 7 and 8, broadly linear on 7, wedge-shaped on 8, convergent posteriorly and tending to turn dorsad at their posterior ends. The small middorsal humps on 1 and 2 often tinged with brown or orange. Subdorsal pale line absent. Dorsal half of supraspiracular area paler than the ventral half and tinged with brown, ventral half margined ventrally by a strongly sinuous black line or stripe bent strongly dorsad on 1 and in a loop ventrad to include IV on 7. Spiracles white, included in the ventral loops of the dorsal coloration. Subventral pale stripe sometimes distinct but usually obscure. Venter of rather dilute dorsal coloration. Setigerous tubercles minute. Head pale with black submedian arcs and reticulation.

Described from many larvae collected in Washington. The winter is passed as larvae. These begin to become mature in April and occur in reduced numbers through May. Moths have emerged in May, June, and July. Moths determined by Benjamin.

*Distribution.*—United States: California, Oregon, and Washington. Canada: British Columbia.

*Food plants.*—Huckleberry (*Vaccinium ovatum*), snowberry (*Symphoricarpos* sp.), blackberry, salmonberry (*Rubus spectabilis*), and Indian-plum (*Osmaronia cerasiformis*).

## ADELPHAGROTIS INDETERMINATA (Wlk.)

Head 2.4 to 2.7 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout, with a small, distinct, rounded middorsal hump on abdominal segment 1, a slight similar hump on 2, and a distinct dorsal hump on 8; skin smooth; general color varying from light mottled gray to pale brownish mottled gray.

The details of coloration are essentially the same as those described for *stellaris*.

Described from numerous larvae collected in Washington. The winter is passed as larvae which begin to reach maturity in April and are found up to the latter part of May. Moths have emerged in June and July. Moths determined by Benjamin.

*Distribution*.—United States: California, Arizona, Oregon, Idaho, Washington. Canada: British Columbia.

*Food plants*.—Willow, blackberry, hardhack (*Holodiscus*), and spiraea (*Spiraea douglasii*).

## ADELPHAGROTIS QUARTA (Grt.) (?)

Head measurement not taken. Body about 25 mm. long and 4.5 mm. broad at middle, tapering slightly posteriorly, with a small, rounded, distinct middorsal hump on abdominal segment 1, a smaller similar hump on 2 and a slight dorsal hump on 8; skin smooth; general color dark with a pale dorsal area and conspicuous white spots postero-ventrad of the spiracles.

A pale middorsal area the width of the space between setigerous tubercles I, tinged with brownish or orange, especially on the humps. A segmental series of dark markings more conspicuous and black on abdominal segments 7 and 8, curving between I and II and margined ventrally by a pale mark arising ventrad of II. Supraspiracular area brownish dorsally becoming darker toward the spiracles and bordered ventrally by a sinuous black line. Spiracles white, in the dark ventral loops of the supraspiracular coloration. Subventral pale stripe inconspicuous, dull purplish, except that it is broadened ventro-posterior to each spiracle to form a conspicuous white spot, larger on anterior abdominal segments, and also present in a similar position on the thorax. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head pale with black submedian arcs and reticulation.

Described from one larva collected by Wm. W. Baker, April 5, 1939, at Electron, Wash., near the lower end of the inclined railway. The larva entered the soil for pupation but no moth emerged.

*Distribution*.—California and Washington.

*Food plant*.—Indian-plum (*Osmaronia cerasiformis*).

## PROTOLAMPRA McD.

## ABAGROTIS Sm.

## RHYNCHAGROTIS Sm.

1. With wedge-shaped black segmental markings anterior to setigerous tubercle II, at least on abdominal segments 7 and 8. Spiracles often brown, infuscated brown, or black. Mandible normally with a basal tooth on oral face bearing a minute molar area or none except in *Rhynchagrotis cupida* in which an eroded process is present (pl. 5, II)----- 6  
Without definite subdorsal segmental markings but with a dark, transverse, dorsal spot or line posteriorly on abdominal segment 8. Spiracles white or whitish, sometimes tinged with brown. Mandible normally with a basal process on oral face bearing a large molar area (pl. 5, F) but this sometimes reduced to a tooth----- 2

2. Of predominantly eastern distribution. Head of mature larva 3 mm. broad. Reticulation of body intensified to form a segmental series of obscure, diffuse dark paired spots anterior to setigerous tubercle II and including I.----- *Abagrotis alternata*  
Of predominantly western distribution. Head of mature larva 2.6 mm. broad or less. No segmental series of dark dorsal spots except in *Abagrotis trigona* var. *sambo*.----- 3
3. Reported from Arizona only. General color dark gray. Middorsal line slender. Head pale brown with black submedian arcs and reticulation.----- *Abagrotis alcandola*  
Of wider distribution.----- 4
4. General color light brown. Middorsal pale line scarcely indicated. Head a decided brown with black submedian arcs and reticulation, the reticulation becoming reddish posterior to the ocelli.----- *Abagrotis trigona* var. *sambo*  
Coloration not as above.----- 5
5. General color purplish gray to infuscated brown. Middorsal white line usually distinct but subdued in appearance. Head a decided brown with black to brownish submedian arcs and brown to reddish reticulation.----- *Protolampra rufpectus*  
General color brownish to purplish brown. Middorsal line usually yellowish, strong, sharply defined. Head very pale brown with dark submedian arcs and reticulation.----- *Abagrotis erratica*
6. Of predominantly eastern distribution. Mandible with a basal process bearing a large molar area, the outer wall of the process normally with an eroded margin, the inner wall often incomplete and sometimes absent (pl. 5, *P*).----- 7  
Of predominantly western distribution. Mandible with a thin basal tooth on oral face, the molar area minute or absent.----- 8
7. Head of mature larva 2.5 to 3 mm. broad.----- *Rhynchagrotis cupida* (Eastern)  
Head of mature larva 2.1 to 2.3 mm. broad.----- *Rhynchagrotis cupida* (Western)
8. Emargination in apical margin of labrum broad and shallow, the depth of the emargination and length of labrum in a ratio of approximately 6:32. Feed exclusively on sage brush.----- 9  
Emargination in apical margin of labrum deeper, depth of emargination and length of labrum in a ratio of approximately 10:32. Do not feed on sage brush.----- 10
9. Body tapering strongly posteriorly. A loop of the dark dorsal coloration invading the pale subventral stripe and including setigerous tubercle IV on abdominal segment 7. Basal tooth on oral face of mandible simple.----- *Abagrotis duanca*  
Abdominal segments of approximately equal width throughout. No loop of the dark dorsal coloration invading the subventral pale stripe on 7. Basal tooth on mandible normally bidentate apically.----- *Abagrotis naualis*
10. Spiracles decided brown to infuscated brown, varying occasionally to dark gray.----- 11  
Spiracles white, yellowish, or pale brown, occasionally decidedly brown in *barnesi*.----- 13
11. Venter dark throughout, reticulate with blackish. Segmental black marks anterior to setigerous tubercle II on abdominal segments slender but distinct and subtriangular on 7 and 8.----- *Abagrotis forbesi*  
Venter pale.----- 12
12. A segmental series of obscure dark marks anterior to setigerous tubercle II, more definite and wedge-shaped on abdominal segments 7 and 8 although still diffuse on these segments.----- *Abagrotis discoidalis*  
A segmental series of black marks anterior to II on abdominal segments, intensely black, wedge-shaped and sharply defined on 7 and 8.----- *Abagrotis nefascia*
13. With a segmental series of subdued, pale V-shaped dorsal figures arising subdorsally and including setigerous tubercle II, the apex middorsal on the segment following that bearing the arms of the V. General color soft dark gray. Head of mature larva 2.8 to 3.1 mm. broad.----- *Abagrotis variata*  
Without a segmental series of pale V-shaped dorsal figures.----- 14
14. General color whitish to pale gray, sometimes tinged with brownish. Black markings anterior to setigerous tubercle II appearing on all abdominal segments, usually decidedly wedge-shaped on 7 and 8. Head of mature larva 2.6 to 2.7 mm. broad.----- *Abagrotis barnesi*

- General color brownish or brownish gray. Black markings anterior to II often absent on anterior abdominal segments, linear throughout or narrowly wedge-shaped on abdominal segments 7 and 8. Head of mature larva 2.4 mm. broad.
15. General color brownish gray, sometimes varying to blackish. Spiracles yellow to pale brown. Head pale brownish. *Abagrotis* n. sp. (No. 22)  
General color brownish. Spiracles white. Head a decided brown

*Abagrotis appoita*

#### ABAGROTIS ALTERNATA (Grt.)

Head 3 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color infuscated brown.

Middorsal pale line distinct, broken at the incisures and often expanded to form a diffuse pale area including 2 transverse black lines on each abdominal segment. A segmental series of ill-defined dark markings on anterior half of abdominal segments with II in posterior margin and including I. A black transverse line margined posteriorly by a pale line posteriorly on dorsum of 8. Subdorsal pale line ventrad of II faint or absent. Supraspiracular area darker in ventral portion, including III and the spiracles, with a sinuous black band at ventral margin. Spiracles pale brownish. Subventral pale stripe indefinite, sometimes defined by a brownish shade. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head pale brown with black submedian arcs tending to fade out anteriorly and blackish to ferruginous reticulation.

Described from 11 larvae collected in Tennessee in April and 3 inflated specimens from the U. S. National Museum. Very small larvae were present in large numbers among dead leaves in deciduous woods in February 1927 and some of these were mature in April. Dyar determined moths.

*Distribution*.—Occurs rather generally east of the Mississippi River north of the latitude of the southern boundaries of North Carolina and Tennessee and more sparingly to the westward. The United States records include: Arizona, New Mexico, Utah, Colorado, Kansas, Missouri, Minnesota, Tennessee, North Carolina, Illinois, Indiana, Ohio, Pennsylvania, New Jersey, Michigan, New York, Connecticut, Massachusetts, and Maine, while the Canadian Province records include: Alberta, Manitoba, Ontario, and Quebec.

*Food plants*.—Buds of apple, hickory, oak, and walnut, and strawberry plants.

#### ABAGROTIS ALCANDOLA (Sm.)

Head 2.4 to 2.6 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, abdominal segments 7 and 8 slightly broadened; skin smooth; general color dark gray.

Dorsum to and including the spiracles uniform dark gray composed of a dark reticulation on a sordid brownish ground. A slender, distinct, white middorsal line with narrow dark margins. Dorsum of abdominal segment 8 darker than other segments and margined by a transverse pale area at posterior margin. Spiracles white. Venter sharply paler than the dorsum, of dilute dorsal coloration tinged with purplish. A pale line ventrad of the spiracles but no definite subventral pale stripe. Setigerous tubercles minute. Head pale brown with black submedian arcs and reticulation.

Described from numerous larvae collected in Arizona, April 27, 1938, near the Seven Springs CCC Camp about 55 miles north of Phoenix, among dead leaves at base of ash trees. Moths emerged in September and were determined by Clarke.

*Distribution*.—Arizona.

*Food plant*.—Ash (*Fraxinus* sp.).

## ABACROTIS TRIGONA var. SAMBO (Sm.)

(Teste F. H. Benjamin)

Head 2.2 to 2.4 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color light brown.

Dorsal coloration nearly uniform to and including the spiracles. Middorsal pale line scarcely indicated except on thorax. Diffuse dark reticulation curving between setigerous tubercles I and II tending to outline a segmental series of vague shield-shaped dorsal figures. An inconspicuous, black, transverse line, broken medially on dorsum of abdominal segment 8, margined posteriorly by a pale line. Subdorsal pale line, ventrad of II, very faint, broken. Supraspiracular area faintly paler dorsally. Spiracles white. Subventral pale stripe faintly indicated, more definite at dorsal margin. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head a decided brown with black submedian arcs, less intense anteriorly, and dark reticulation becoming reddish posterior to the ocelli.

Described from 15 larvae collected about Puyallup, Wash., in dry upland during April and May. Moths emerged in June and July and were determined by Clarke as *sambo* Sm. A very short time before his death Mr. Benjamin had determined a moth reared at Puyallup as "*Lampra trigona* var. *sambo*."

*Distribution*.—Variety *sambo* is found in Washington, Montana, and British Columbia, while *trigona* is recorded from New Mexico, Arizona, California, Utah, and Colorado.

*Food plant*.—Willow (*Salix scouleriana*).

## PROTOLAMPRA McD.

## PROTOLAMPRA RUFIPLECTUS (Morr.)

Head 2.4 to 2.6 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments 7 and 8 very slightly broadened; skin smooth, with a silky sheen; general color purplish gray to infuscated brown.

General coloration to and including the spiracles of one shade composed of close dark reticulation on a brownish or purplish ground. Middorsal line white, usually distinct but subdued in color. Dorsal area without dark markings except that a darker area between setigerous tubercles II may be present on abdominal segment 8, bordered posteriorly by a transverse pale line. Subdorsal pale line ventrad of II faint or absent. Supraspiracular area sometimes with a small darker spot at each abdominal spiracle. Spiracles white, pale yellowish or occasionally pale yellowish brown. Subventral pale stripe usually indicated but not conspicuous. Venter to base of prolegs of dilute dorsal coloration, paler midventrally. Setigerous tubercles minute. Head a decided brown with black to brownish submedian arcs and brown to reddish reticulation.

Described from many larvae collected in Washington. Larvae begin to become mature early in May and occur until the latter part of June. Moths have emerged from late in June to about the third week of July. Moths determined by Benjamin.

*Distribution*.—State records include: Arizona, California, Utah, Colorado, Wyoming, Oregon, Washington, Idaho, Montana, Pennsylvania, New Jersey, New York, and Maine. Occurs also in the following Canadian Provinces: British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, and Quebec.

*Food plants*.—Willow (*Salix* sp.), spiraea (*Spiraea douglasi*), and serviceberry (*Amelanchier florida*).

## ABACROTIS ERRATICA (Sm.)

Head 2.3 to 2.5 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color brownish to purplish brown.

General color uniform to and including the spiracles. Middorsal line usually yellowish, strong, sharply defined and continuous except at the incisures. No dark dorsal or subdorsal markings except a slight intensification on dorsum of abdominal segment 8 bordered posteriorly by a transverse pale line. Subdorsal pale line obscure. Supraspiracular area uniform in coloration. Spiracles pale to pale brown. Subventral pale stripe ill-defined, more definite at dorsal margin. Venter more purplish than the dorsum. Setigerous tubercles minute. Head very pale brown with dark submedian arcs and reticulation.

Described from many larvae collected in Washington. Larvae begin to reach maturity about the middle of May and are present until the latter part of June. Moths have emerged from about the middle of July to the middle of August. Moths determined by Benjamin.

*Distribution.*—California, Utah, Idaho, Washington, British Columbia, and Manitoba.

*Food plant.*—Willow (*Salix* sp.).

## RHYNCHAGROTIS Sm.

## RHYNCHAGROTIS CUPIDA (Grt.)

## Eastern larvae:

Head 2.5 to 3 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color brown to infuscated brown, varying sometimes to gray.

Middorsal pale line broad, broken, diffuse. A segmental series of elongate black spots anterior to setigerous tubercle II, somewhat diffuse on their dorsal margins, more distinct and wedge-shaped on abdominal segments 7 and 8. Subdorsal pale lines broken, inconspicuous. Supraspiracular area uniform brown overlaid with blackish flecks. Spiracles pale brownish. A subdued pale subventral band tinged with pink. Venter pale. Setigerous tubercles minute. Head pale brown with black submedian arcs and reticulation.

Described from 20 live larvae taken injuring apple, grape, and peach trees at Ogontz and Berlin Heights, Ohio, in May 1924, by G. A. Runner; one larva collected March 23, 1918, at South Boston, Va., by J. U. Gilmore, and a few larvae collected in Tennessee in March. Eggs deposited by a captive moth October 26, 1916, hatched November 8, 1916, and some of the larvae were shortening for pupation April 15, 1917. The parent moth was determined by Dyar and later by Benjamin. Reared moths from the Ohio material emerged in June and were determined by Dyar and later by Benjamin.

*Distribution.*—Generally distributed in the East, north of the southern boundaries of North Carolina, Tennessee, Missouri, and Kansas.

*Food plants.*—Buds and newer growth of apple, grape, and peach trees.

## Western larvae:

The small number of larvae collected have been about equally divided between a brown and a purple phase. The purple larvae are of that color both dorsally and ventrally with deep blackish brown spiracles and may belong to some other species, but moths reared from the brown larvae were determined by Benjamin and are of the species described below.

Head 2.1 to 2.3 mm. broad. Body about 25 mm. long and 4 mm. broad, abdominal segments of approximately equal width throughout; skin smooth; general color brown.

Middorsal pale line obscure except on the thorax. A segmental series of shield-shaped dark dorsal figures indicated only by faint dark lines outlining them. Black marks anterior to setigerous tubercle II evident on abdominal segments 6, 7, and 8 only, wedge-shaped on 7 and 8, and joined across the dorsum on 8. Spiracles pale yellowish. Subventral pale stripe margined dorsally by a sinuous pale line, the stripe fading out ventrally. Venter of dilute dorsal coloration paler midventrally. Setigerous tubercles minute. Head pale brown with black submedian arcs and infuscated brown reticulation becoming reddish posterior to the ocelli.

Described from eight larvae collected in April and May near Puyallup, Wash., by beating upland shrubs at night. Three moths emerged in May and June and were determined by Benjamin.

*Distribution.*—United States: Colorado, Utah, and Washington. Canada: British Columbia.

*Food plant.*—Willow.

#### ABAGROTIS DUANCA (Sm.)

Head 2.1 to 2.3 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin smooth; general color light gray faintly tinged with purplish.

A strong middorsal pale line, sometimes broken at the incisures. On abdominal segments a segmental series of broadly connected, convex-sided figures made up of dark reticulation and pale medially, sometimes obscure. Subdorsal pale line almost as strong as the middorsal, giving off a branch on each abdominal segment including setigerous tubercle II and extending dorso-posteriorly to posterior margin of segment. Dorsal portion of supraspiracular area gray tinged with brown, ventral portion, including III and the spiracles, darker, sinuate and margined by a black line ventrally, a loop of the dark coloration invading the subventral pale stripe to include IV on abdominal segment 7. Spiracles brown. A strong, sharply defined subventral stripe, white, filled with purplish. Venter of dilute dorsal coloration to base of prolegs, midventer white. Setigerous tubercles minute. Head white tinged with purplish with strong submedian arcs, obsolete anterior to P<sup>1</sup>, and blackish reticulation posteriorly.

Described from many larvae taken through April and May in Washington; original specimens collected by J. F. Gates Clarke and Irvin Bales in Grand Coulee. Moths have emerged in May and June. Moths determined by Benjamin.

*Distribution.*—United States: Arizona, California, Nevada, Utah, Oregon, Washington, and Montana. Canada: British Columbia.

*Food plant.*—Feeds exclusively on sagebrush (*Artemisia*).

#### ABAGROTIS NANALIS (Grt.)

Head 2 to 2.1 mm. broad. Body about 25 mm. long and 3.4 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color rather dark, with black spiracles.

A strong, white, continuous middorsal line. A black stripe in the line of setigerous tubercle II, broadened anterior to the tubercle giving the appearance of an intersegmental series of black wedges, the narrower portion on one segment, the broader portion on the following segment, the narrower portion sometimes absent. Subdorsal line strong, continuous, white, giving off a short branch including II. Dorsal third of supraspiracular area pale, sharply defined, and obscurely reticulate with reddish, remainder of same color as the dorsum with a dark line in the line of the spiracles. Spiracles black. Subventral stripe indefinite but for the marginal white lines and reticulate with reddish. Venter of dilute dorsal coloration to base of prolegs, pale midventrally. Setigerous tubercles minute. Head pale with black submedian arcs and dilute black reticulation, becoming reddish posterior to the ocelli.

Described from many larvae taken in eastern Washington, the original specimens collected by C. W. Getzendaner. Larvae begin to become mature about the middle of May and are present to at least the first of June. Moths have emerged in August, determined by Benjamin.

*Distribution.*—California, Utah, Colorado, Montana, and Washington.

*Food plant.*—Feeds exclusively on sagebrush (*Artemisia*).

#### ABAGROTIS FORBESI (Benj.)

Head 2.2 to 2.3 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of equal width throughout; skin smooth; general color varying from dark gray to pale gray.

Coloration made up of a close blackish reticulation on a pale ground with some evidence of a brownish tinge. Middorsal pale line may be distinct or obscure. A segmental series of dark dorsal figures on abdominal segments indicated but inconspicuous. A segmental series of black marks anterior to setigerous tubercle II on each abdominal segment, linear anteriorly, slender but subtriangular on 7 and 8, the pair on 8 nearly or quite joined across the dorsum. Subdorsal pale line inconspicuous. Supraspiracular area uniform in color without any intensification in the line of the spiracles. Spiracles dark infuscated brown. Subventral pale stripe subdued, bordered dorsally by a pale line. Venter dusky throughout, reticulate with blackish. Head pale with no brownish tinge, submedian arcs and reticulation black.

Described from 6 larvae, 4 collected near Ellensburg, Wash., April 21, 1935, by Wm. W. Baker and the writer, and two near Cashmere, May 25, 1935, by C. W. Getzendaner. Three moths emerged in June and early July and were determined by Benjamin.

*Distribution.*—United States: Utah, Colorado, and Washington. Canada: British Columbia.

*Food plant.*—Serviceberry (*Amelanchier* sp.).

#### ABAGROTIS DISCOIDALIS (Grt.)

Head 2.1 to 2.4 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color rather light gray.

Dorsal color of much the same shade to and including the spiracles. Middorsal pale line strong, broken at the incisures. A segmental series of obscurely wedge-shaped dark markings on abdominal segments, anterior to setigerous tubercle II, indefinite dorsally but intensified to black on their ventral margins and more distinct on posterior segments although still diffused. Subdorsal pale line broken but distinct. Dorsal one-third of supraspiracular area occupied by an indefinite pale stripe, ventral portion reticulate with blackish. Spiracles blackish brown with brown rims. Subventral pale stripe obscure except at dorsal margin. Venter pale, flecked with white. Setigerous tubercles minute. Head pale with dark submedian arcs and reticulation.

Described from five larvae collected April 19, 1931, near White Swan, Wash., by beating the food plant at night. Two moths emerged early in June and were determined by Benjamin.

*Distribution.*—California, Nevada, Utah, and Washington.

*Food plant.*—Greasewood (*Sarcobatus vermiculatus*).

#### ABAGROTIS NEFASCIA (Sm.)

Head 2.3 to 2.5 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of equal width throughout; skin smooth; general color usually some shade of brown but varying occasionally to gray or blackish.

Coloration to and entirely including the spiracles nearly uniform except in a segmental series of obscure, darker shield-shaped dorsal figures margined and outlined posteriorly by oblique pale triangular areas. Middorsal pale line slender, broken. A segmental series of black marks anterior to setigerous tubercle II on abdominal segments, linear anteriorly, wedge-shaped on 7 and 8. Subdorsal pale line very inconspicuous. Supraspiracular area uniform in color. Spiracles usually a decided brown but occasionally dark gray. Subventral pale stripe indefinite except at dorsal margin. Venter of dilute dorsal coloration to base of prolegs, pale midventrally, much flecked with white. Head pale or pale brownish with black submedian arcs and reticulation.

Described from many larvae collected in eastern Washington. Larvae have been taken in April and early May, and moths have emerged in May and June. Moths determined by Benjamin and in later years by Clarke.

*Distribution.*—Restricted to areas west of the Rocky Mountains. The records include: United States: Arizona, New Mexico, California, Nevada, Utah, Colorado, Washington, and Montana. Canada: British Columbia.

*Food plants.*—Willow, cottonwood, ocean spray (*Holodiscus*) and introduced boxelder (*Acer negundo*).

#### ABAGROTIS VARIATA (Grt.)

Head 2.8 to 3.1 mm. broad. Body about 35 mm. long and 5.5 mm. broad at middle, abdominal segments of equal width throughout; skin smooth; general color dark gray with a segmental series of pale V-shaped dorsal markings.

Middorsal pale line strong, continuous. A segmental series of dark, somewhat shield-shaped dorsal figures, composed of reticulation and rather diffuse on anterior abdominal segments but tending to form definite, black, wedge-shaped spots subdorsally on 7 and 8. Dark dorsal figures margined laterally and posteriorly by a segmental series of subdued, pale V-shaped figures, the arms arising subdorsally and extending immediately posterior to II, the angle middorsal anteriorly on following segment. Subdorsal pale line obscure. Supraspiracular area sinuous on ventral margin, including all spiracles, and usually margined ventrally by a black line or stripe; dorsal portion sometimes brownish. Spiracles pale or pale brown. Subventral pale stripe distinct throughout or at dorsal margin only. Venter of dilute dorsal coloration to base of prolegs, pale midventrally. Setigerous tubercles minute. Head pale or pale brown with dark submedian arcs and reticulation.

Described from numerous larvae collected in Washington. Larvae become mature in April and May, and moths emerge in June. Moths determined by Benjamin.

*Distribution.*—United States: Confined to areas west of the Rocky Mountains. The records include: Arizona, New Mexico, California, Nevada, Utah, Colorado, Washington, and Montana. Canada: British Columbia and Saskatchewan.

*Food plants.*—Willow, alder, wild cherry, serviceberry (*Amelanchier*), and mullein (*Verbascum thapsus*).

#### ABAGROTIS BARNESI (Benj.)

Head 2.6 to 2.7 mm. broad. Body about 30 to 35 mm. long and 5 to 6 mm. broad at middle, abdominal segments of equal width throughout; skin smooth; general color whitish to pale gray sometimes tinged with brownish.

Coloration nearly uniform to the spiracles, except as indicated below, composed of black to blackish flecks or reticulation on a pale ground sometimes tinged with brown. Middorsal pale line may be strong or but faintly indicated. A segmental series of dark dorsal shield-shaped markings more distinct on first 3 abdominal segments may be apparent. A segmental series of black marks anterior to seti-

gerous tubercle II, linear anteriorly, appearing on all abdominal segments and approaching a wedge-shaped outline on 7 and 8. Subdorsal pale line broken, inconspicuous. Ventral portion of supraspiracular area usually darker than the dorsal portion and sometimes margined ventrally by a darker line or stripe including the spiracles. Spiracles varying in color from pale yellowish to deep brown. Subventral pale stripe distinct or obscure, particularly ventrally. Venter of dilute dorsal coloration to base of prolegs, pale flecked with white midventrally. Setigerous tubercles minute. Head brownish or pale with black submedian arcs and black to ferruginous reticulation.

Described from many live larvae from Washington, Arizona, and Colorado. Larvae are mature in March in Arizona, in April in Washington. Moths have emerged from late in May to the last of June in Washington. Moths determined by Benjamin.

*Distribution*.—Occurs generally west of the Rocky Mountains and sparingly eastward. The eastward records include: Kansas, Nebraska, Illinois, Michigan, and New York.

*Food plants*.—Apple, peach, cherry, cottonwood (*Populus*), serviceberry (*Amelanchier*), and introduced boxelder (*Acer negundo*). This is the most common climbing cutworm in the drier areas of the West and has caused serious damage in several cases.

#### ABACROTIS n. sp. (No. 22)

(Teste F. H. Benjamin)

Head 2.3 to 2.4 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color brownish gray sometimes varying to blackish.

Coloration of dorsum to and including the spiracles nearly uniform, composed of blackish flecks and reticulation on a pale brownish ground. Middorsal pale line broken, inconspicuous. A segmental series of dark, shield-shaped dorsal figures with II at posterior margin may or may not be outlined on abdominal segments. A segmental series of black marks anterior to setigerous tubercle II on abdominal segments, linear throughout or subtriangular on 7 and 8, often absent anteriorly. Subdorsal pale line broken, inconspicuous. Supraspiracular area almost uniform in coloration, sometimes with a black line at the spiracles and faintly brownish on dorsal third. Spiracles yellowish to brown. Subventral pale stripe distinct throughout or at dorsal margin only. Venter to base of prolegs of dilute dorsal coloration, pale or brownish closely flecked with white midventrally. Setigerous tubercles minute. Head pale brownish with black submedian arcs and blackish to ferruginous reticulation.

Described from many larvae collected in eastern Washington. Larvae have been collected from the first of April to early in May and all reared moths have emerged in June. Moths determined by Benjamin. Originally this species was determined by Mr. Benjamin as *placida* Grt., and it is the "placida," the larva of which was described by Crumb (20), but with the accumulation of 28 reared moths he became convinced that these represented a new species and indicated types in the series to which he gave a manuscript name. The description was not published owing to Mr. Benjamin's untimely death and the manuscript has never been found.

*Distribution*.—Washington.

*Food plants*.—Serviceberry (*Amelanchier*) and wild currant (*Ribes aureum*).

#### ABACROTIS APPOSITA (Grt.)

Head and body measurements not taken. Abdominal segments of approximately equal width throughout; skin smooth; general color brownish with subdorsal black markings scarcely noticeable except on abdominal segments 7 and 8.

Coloration made up of a blackish reticulation on a brown ground. Middorsal pale line broken, inconspicuous, but present throughout. A segmental series of shield-shaped dark dorsal figures barely indicated. Dilute blackish marks anterior to setigerous tubercle II scarcely noticeable except on abdominal segments 7 and 8; subcuneate on 8 where they are bordered posteriorly by a transverse yellow line. Subdorsal pale line scarcely at all represented. Supraspiracular area of dorsal color with a slender black line in the line of the spiracles. Spiracles white. Subventral pale stripe indefinite ventrally and without a definite pale line at dorsal margin. Venter pale, reticulate with white. Setigerous tubercles minute. Head a distinct brown with black submedian arcs and reticulation.

Described from one larvae collected April 21, 1935, on the old road to Ellensburg, Wash., a few miles west of that city among dead leaves in a small clump of *Amelanchier* bushes in company with larvae of *Abagrotis forbesi* Benj. The moth emerged June 12, 1935, and was determined by Benjamin.

*Distribution*.—United States: California, Colorado, and Washington. Canada: British Columbia.

*Food plant*.—Serviceberry (*Amelanchier* sp.).

### Subfamily HADENINAE

Of the species now listed under *Xylomyges*, only *curialis* Grt. and *rubrica* Harv., of the species included here, agree with the larva of the type (*conspicillaris* L.), and *Xylomania* Hamp. (type *hiemalis* Grt.) has been reinstated to include the remaining species, although *dolosa* Grt. is somewhat aberrant.

The species of *Xylomania*, insofar as their habits are known, conceal themselves among folded leaves on trees, while larvae of *Xylomyges* are free living on herbs and trees.

As indicated in the generic key, several groups of species now included in *Polia* seem to be as worthy of generic rank as are *Miselin*, *Hadena*, and *Ceramica* but, in the key to the species, the various groups are combined except the genera represented by *detracta* Wlk. (No. 7) and *delecta* B. & McD. (No. 10).

1. Oral face of mandible with a basal tooth or process (pl. 5, A-H) ----- 22
- Oral face of mandible without a basal tooth or process (pl. 5, I-N), bases of ribs elevated giving the appearance of teeth in some *Leucania* ----- 2
2. Height of prothoracic spiracle much greater than height of spiracle on abdominal segment 1 (30:23). Mandible very large with the labrum comparatively small leaving most of the mandible exposed. Width of labrum much less than width of mandibles from base to base (30:56), the anterior margin far above the line of the basal mandibular setae ----- 19
- Height of prothoracic spiracle but slightly greater than height of spiracle on abdominal segment 1 (30:28). Mandible not conspicuously large. Width of labrum usually more nearly equal to combined width of mandibles (25:35), the anterior margin usually near the line of the basal mandibular setae ----- 3
3. The series of midventral muscle attachments between and anterior to the prolegs forming a Y, open anteriorly, with the area between the arms impressed on abdominal segments 3 and 4 (pl. 8, G), except in a few species of *Laciniolia* in which both the skin and cervical shield are granulose. Setigerous tubercle VI with two setae on prothorax and but 1 seta on remaining thoracic segments ----- 4
- Midventral muscle attachments forming a line, no V-shaped impressed area anterior to base of prolegs except in *Xanthopastis* in which VI is bisetose on all thoracic segments. Skin with minute granules in some *Homorthodes* and cervical shield obscurely granulose in *Scotogramma* ----- 10

4. A pair of black sclerotized plates between each pair of abdominal prolegs. Cervical shield white or pink with broad black anterior and lateral margins. Labial palpus approximately one-half as long as spinneret with the third segment one-fourth as long as the basal segment or less (2:8). Hind coxae usually the femur width apart or more. Skin pavement-granulose. *Protorthodes*  
No sclerotized plates between prolegs. Coloration of cervical shield not as above----- 5
5. Skin and usually the cervical shield granulose, the granules minute in the *pensilis* group----- *Laciniipolita*  
Skin and cervical shield without granules, minutely pubescent in some *Lasionycta*----- 6
6. Skin bearing minute pubescence. Setae on labrum short, stout, spurlike. Hind coxae about twice the femur width apart. Spinneret without an apical silk pore (pl. 2, J-O)----- *Lasionycta* in part  
Skin not pubescent. Setae on labrum setiform. Hind coxae not more than the width of the femur apart. Spinneret with an open apical silk pore (pls. 2, P-S, and 3, A-H)----- 7
7. Labial palpus, at least, almost as long as the spinneret, with the third segment one-half as long as the basal segment or more. Occipital angle a right angle----- 8  
Labial palpus much shorter than the spinneret (16:30), with the third segment one-sixth as long as the basal segment or less. Occipital angle acute----- 9
8. Height of front approximately equal to length of median line. Head with strong black reticulation. Rather generally distributed east of the Rocky Mountains and reported from Montana, Alberta, and British Columbia in the west----- *Genus No. 7*  
Height of front much greater than length of median line (31:22). Head with black freckles overlaid with black suffusion. Found in Washington, British Columbia, Alberta, Montana, and Colorado  
*Lasionycta* in part (*perpleva*)
9. Two setigerous tubercles of the VII group (VII<sup>a</sup> and VII<sup>b</sup>) present on abdominal segment 8----- *Genus No. 8*  
But the usual one seta in the VII group present on 8----- *Lasiestra*
10. Setigerous tubercle VI with two setae on all thoracic segments. Coloration made up of transverse black and white stripes----- *Xanthopastis*  
Setigerous tubercle VI with 2 setae on prothorax and but 1 seta on each of the remaining thoracic segments----- 11
11. Abdomen tapering posteriorly, not broadened on abdominal segments 7 and 8. Spiracles white or yellowish----- 12  
Abdomen distinctly broadened on abdominal segments 7 and 8. Spiracles brown or black except orange in *Homorthodes fufurata* and white in *Lophoceramica*----- 15
12. Length of spinneret less than twice the median width (16:11). Height of front much greater than length of median line (32:21), (39:18)----- 13  
Length of spinneret equal to three times the median width or more (13:6). Height of front equal to length of median line or less----- 14
13. Occipital angle distinctly acute. Labial palpus and spinneret subequal in length, with third segment shorter than the basal segment (6:10). Line of setae P<sup>1</sup> at or above apex of front----- *Scotogramma*  
Occipital angle a right angle. Labial palpus much longer than the spinneret (29:16), with third segment much longer than the basal segment (17:12). Line of setae P<sup>1</sup> below apex of front----- *Miodera*
14. Setae A<sup>1</sup>-A<sup>2</sup>-A<sup>3</sup> forming a decidedly obtuse angle at A<sup>2</sup>. Spinneret without an open apical silk pore (pl. 2, A-O). Rather generally distributed west of the Rocky Mountains----- *Zostropoda*  
Setae A<sup>1</sup>-A<sup>2</sup>-A<sup>3</sup> forming a right angle at A<sup>2</sup>. Spinneret with an open apical silk pore (pls. 2, P-S and 3, A-H). Circumpolar or on high mountains southward----- *Anarta*
15. Labial palpus twice as long as the obscure, membranous spinneret which bears spines or processes apically (pl. 2, J). Head with a straight black stripe arising above antennal insertion and broadening to posterior margin of head----- *Orthodes*  
Labial palpus distinctly less than twice as long as the spinneret. Spinneret without apical spines or processes. Coloration of head not as above except somewhat similar in *Pseudorthodes*----- 16

16. Labial palpus much shorter than the spinneret (15:22) with the third segment not more than one-third as long as the basal segment. Spinneret without an apical silk pore.----- *Pseudorthodes*  
 Length of labial palpus equal to or greater than that of the spinneret with the third segment at least one-half as long as the basal segment. Spinneret with an apical silk pore.----- 17
17. Spinneret distinctly grooved dorsally. Setigerous tubercles I and II minute on abdominal segment 9.----- 18  
 Spinneret with a slender, impressed line middorsally. Setigerous tubercles I and II moderately large on abdominal segment 9 but flat  
*Tricholita, Lophoceramica*
18. Known distribution confined to Arizona, California, Texas, and Utah. Feeds on herbs.----- Genus No. 9  
 Of much wider distribution. Feed on live and dead leaves of cottonwood and various shrubs.----- *Homorthodes*
19. Labial palpus much shorter than the spinneret (26:36). Lingua of hypopharynx bare or bearing minute spinules anteriorly (pl. 3, B). Frontal punctures below the line of the frontal setae. Mandible with four distinct teeth.----- 20  
 Labial palpus at least as long as the spinneret. Lingua of hypopharynx often with long hairs anteriorly. Teeth on cutting margin of mandible obscure or reduced to two.----- 21
20. Anterior margin of labrum very broadly emarginate (pl. 10, F). Of more general distribution.----- *Faronta* Sm.  
 Anterior margin of labrum narrowly emarginate. Distribution limited to areas west of the Rocky Mountains.----- *Dargida*
21. Midventral muscle attachments between and anterior to the prolegs on abdominal segments 3 and 4 arranged in a line. Spinneret with spinules on anterior margin (pl. 2, K). Setigerous tubercle II<sup>o</sup> present on prothorax, the seta modified, threadlike. Skin smooth.----- *Aletia, Pseudaletia, Leucania*  
 Midventral muscle attachments between and anterior to the prolegs on abdominal segments 3 and 4 forming a Y with the arms anterior, the area between the arms impressed. Spinneret without spinules on apical margin. Setigerous tubercle II<sup>o</sup> absent on prothorax. Skin set closely with moderately large, flattened granules.----- *Nephelodes*
22. Height of spiracle on abdominal segment 1 nearly equal to that of the spiracle on 8 (21:23). Mandible with a basal tooth or thin shelflike projection. Length of spinneret equal to twice the median width or more. Spiracles brown.----- 23  
 Height of spiracle on abdominal segment 1 much less than that of the spiracle on 8 (21:28), except sometimes in *Stretchia* in which the spinneret is but slightly longer than broad (13:10).----- 25
23. Setigerous tubercles A<sup>1</sup>-A<sup>2</sup>-A<sup>3</sup> forming a decidedly obtuse angle at A<sup>2</sup>. Frontal setae twice as near to lateral margin of front as to the adjacent puncture. Ventral setigerous tubercles on abdominal segments 1 and 2 minute. Height of front somewhat less than length of median line (25:30)  
 Genus No. 10  
 Setigerous tubercles A<sup>1</sup>-A<sup>2</sup>-A<sup>3</sup> forming approximately a right angle at A<sup>2</sup>. Frontal setae, at most, but slightly nearer to lateral margin of front than to the adjacent puncture. Ventral setigerous tubercles on abdominal segments 1 and 2 moderately large.----- 24
24. Hind coxae nearly or quite touching. Distribution limited to areas west of the Rocky Mountains.----- *Miselia*  
 Hind coxae approximately one-fourth the femur width apart. Distribution limited to areas east of the Rocky Mountains.----- *Hadena*
25. Oral face of mandible with a basal process bearing an apical molar area (pl. 5, E).----- 31  
 Oral face of mandible with one or more basal teeth or with a thin, shelflike projection, like a process with only the outer wall remaining (pl. 5, D). Neither the teeth nor the shelflike structure bearing a molar area.----- 26
26. Length of spinneret equal to nearly twice length of labial palpus or more. Height of prothoracic spiracle much less than that of the spiracle on abdominal segment 8 (27:35). Setigerous tubercles A<sup>1</sup>-A<sup>2</sup>-A<sup>3</sup> forming a very obtuse angle at A<sup>2</sup>. Spiracles brown. *Polia* in part (*purpurissata*, etc.)

- Labial palpus, at least, nearly as long as the spinneret (22:26). Setigerous tubercles  $A^1-A^2-A^3$ , at most, forming but a slightly obtuse angle at  $A^2$ . Spiracles white, except yellowish brown in *Ceramica* and black in *Xylomania*.
27. Hind coxae touching. Boldly striped larvae ----- 27  
Hind coxae separated, the separation slight in *Xylomania dolosa* in which the spiracles are black. Rather unicolorous larvae ----- 28
28. Setigerous tubercles minute, mere setal insertions. Coloration not as below. *Polia* in part (*legitima*, etc.) ----- 29  
Setigerous tubercles of moderate to large size, black, nearly flat. The black stripe including the spiracles traversed by numerous white lines. *Ceramica* ----- 28
29. Length of spinneret equal to but slightly more than the median width (13:10). Tarsi pale brown. Depth of emargination in anterior margin of labrum equal to less than one-third length of labrum (8:30). Feed exclusively on currant and gooseberry. Distribution limited to areas west of the Rocky Mountains. ----- *Stretchia* 29  
Length of spinneret equal to approximately three times the median width or more. Tarsi black. Depth of emargination in anterior margin of labrum equal to one-half length of labrum (19:40). Feed exclusively on foliage of trees. Distribution limited to areas east of the Rocky Mountains. ----- 30
30. Setigerous tubercle IV postero-ventrad of the spiracle on abdominal segment 2. Spiracles white. ----- *Morrisonia* 30  
Setigerous tubercle IV postero-medial or postero-dorsad of the spiracle on abdominal segment 2. Spiracles black. ----- *Xylomania (dolosa)* 30
31. Spiracles black or blackish. Length and median width of spinneret not far from equal (15:12) ----- 32  
Spiracles neither black nor blackish. Length of spinneret equal to twice the median width or more. ----- *Manestra, Polia, Crocigrapha* 32
32. Dorsal setigerous tubercles moderately large but not conspicuous. Midventral muscle attachments between and anterior to the prolegs forming a Y with the arms anterior on abdominal segments 3 and 4 (pl. 8, G). Hind coxae one-half the femur width apart or more. Height of prothoracic spiracle much greater than that of the spiracle on abdominal segment 1 (28:21). ----- *Xylomania* 32  
Dorsal setigerous tubercles minute, mere setal insertions. Midventral muscle attachments between and anterior to the prolegs forming a line on abdominal segments 3 and 4. Hind coxae but very slightly separated. Height of prothoracic spiracle usually not much greater than that of spiracle on abdominal segment 1 (27:24) ----- *Orthosia, Acerra, Xylomyges* 32

### PROTORTHODES McD.

1. Pale ground color of head overlaid by a brownish or blackish suffusion, except posterior to the ocelli, concealing the submedian arcs on the occiput and obscuring the reticulation. Subdorsal emarginations in posterior margin of anterior black margin on cervical shield absent or not extending anterior to the line of setae  $I^1$  ----- 2  
Pale ground color of head distinct in the interstices of the reticulation. Submedian arcs usually visible but not prominent, reticulation distinct. Subdorsal emarginations in posterior margin of the black anterior margin of the cervical shield often extending anterior to the line of setae  $I^1$  ----- 4
2. Setigerous tubercle I on abdominal segment 1 large, decidedly larger than III, the transverse width nearly or quite equal to the space between tubercles I on this segment (19:21). Head reticulation nearly completely concealed throughout by deep blackish infuscation. The line of setae  $P^1$  on head usually at apex of front. Generally distributed. ----- *oviduca* 2  
Setigerous tubercle I on abdominal segment 1 smaller, at most but slightly larger than III, the transverse width equal to decidedly less than the space between tubercles I on this segment (12:21). Head reticulation rather distinct laterally with the submedian arcs on occiput concealed by uniform infuscation in this area. The line of setae  $P^1$  on head well above apex of front. ----- 3
3. Setigerous tubercle I on abdominal segment 1 distinctly smaller than III. Dark subdorsal markings on 1 extending the length of the segment and rarely differentiated as an isolated black spot opposite tubercle I. Occurs in California, Washington, Montana, and British Columbia ----- *curtica* 3

- Setigerous tubercle I on abdominal segment I slightly larger than III. Dark subdorsal markings not well developed on 1 except in a black spot opposite tubercle I. Occurs in Mexico and Arizona..... *mulina*
4. Spiracles pale brown. Skin pavement granulose and roughened by transverse rugae and ill-defined coarse granules..... *rufula*
5. Area above antennal insertion of the general pale brown color of the head..... *utahensis*
- Area above antennal insertion black..... 6
6. Found both east and west of the Rocky Mountains..... *incincta*
- Distribution limited to areas west of the Rocky Mountains..... *atjkeni*

### PROTORTHODES OVIDUCA (Gr.)

Head 2.2 to 2.4 mm. broad. Body about 29 mm. long and 5 mm. broad at middle; skin pavement granulose; general color gray.

Dorsum brownish gray distinctly paler than the sides to well ventrad of setigerous tubercle II, the usual segmental series of ovoid dark dorsal figures indefinite or absent. Supraspiracular area darkest dorsally, the color thinning out gradually ventrally. Spiracles entirely black. Venter almost unpigmented with a few white flecks. Cervical shield creamy, white with black anterior and lateral margins, the black anterior margin distinctly broader antero-posteriorly than the pale portion posterior to it. Anal shield white with black lateral margins. Setigerous tubercles very large, flat, black, I on abdominal segment 1 decidedly larger than III, the transverse width nearly or quite equal to the space between tubercle I on this segment (19:21). Head ground color and reticulation nearly entirely obscured by deep blackish infuscation, line of setae P<sup>1</sup> usually at apex of front (6 out of 7 specimens).

Described from 12 live larvae collected at Hixson, Tenn., January 18, 1919, by J. U. Gilmore. Moths emerged in March 1919, probably indoors. Moths determined by H. G. Dyar.

*Distribution.*—United States: Maine, New Hampshire, New York, New Jersey, Pennsylvania, North Carolina, Tennessee, Mississippi, Alabama, Florida, Kansas, Colorado, Utah, Arizona, California, and Montana. Canada: British Columbia, Alberta, Manitoba, Ontario, and Quebec.

*Food plants.*—Gilmore's specimens were taken about mullein (*Verbascum*).

### PROTORTHODES CURTICA (Sm.)

Head 2.2 to 2.4 mm. broad. Body about 24 mm. long and 4.5 mm. broad at middle, abdominal segments 7 and 8 slightly broadened; skin pavement-granulose; general color dark gray.

Middorsal pale line usually represented by pale marks near juncture of segments, subdorsal pale line and subventral pale stripe absent. Dorsum including setigerous tubercle II pale with a segmental series of obscure, ovoid dark markings, a pinkish brown, yellow or orange area subdorsally on abdominal segment 8. Black subdorsally, the color becoming gradually more dilute to the prolegs. Spiracles entirely black. Cervical shield white suffused with pink with broad black anterior and lateral margins, the anterior margin not broader antero-posteriorly than the pale portion posterior to it. Anal shield white with black lateral margins. Setigerous tubercles large, flat, black, I on abdominal segment 1 distinctly smaller than III, the transverse width equal to decidedly less than the space between tubercles I on this segment (12:27). Head with a smoky brown or black suffusion nearly obscuring the dark reticulation except posterior to the ocelli, line of setae P<sup>2</sup> above apex of front.

Described from many live larvae collected during April, May, and June east of the Cascade Mountains, in Washington. Moths emerged in August. Moths determined by F. H. Benjamin.

*Distribution.*—United States: California, Washington, and Montana. Canada: British Columbia.

*Food plants.*—Strawberry, mullein, *Balsamorhiza* spp., rabbit brush (*Chrysothamnus*), and various other herbs.

#### PROTORTHODES MULINA (Schaus)

Head 2.2 to 2.4 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin pavement-granulose; general color dark gray.

Middorsal pale line almost entirely absent. Dorsum, including setigerous tubercle II, somewhat paler than the supraspiracular area, with a segmental series of obscure, ovoid darker middorsal figures, II in an obscure, sinuous pale stripe bordered ventrally by an obscure, sinuous dark stripe which tends to form dark spots subdorsally opposite setigerous tubercle I on anterior abdominal segments, a pale lateral area usually present on 8. Spiracles entirely black, in the obscure subventral stripe which is made up of pale reticulation. Venter dark, sordid, flecked with white. Cervical shield white with black anterior and lateral margins, the anterior margin slightly broader antero-posteriorly than the pale portion posterior to it. Anal shield white with broad black lateral and narrow posterior margins. Setigerous tubercles large, flat, black, I on abdominal segment 1 slightly larger than III, the transverse width on I decidedly less than the space between tubercles I on this segment (12:21). Head pale but the ground color visible only in a small area above and posterior to the ocelli otherwise heavily infuscated, sometimes with a little reticulation visible laterally, line of setae P' above apex of front.

Described from 10 larvae collected III.20-24.38 about Superior, Ariz., under stones, dead leaves, and weed debris. Moths emerged in May 1938 at Puyallup, Wash. Moths determined by J. F. Gates Clarke. This seems to be the first record of the occurrence of this species in the United States.

*Distribution.*—Arizona and Mexico.

*Food plants.*—No definite food plants are known, but the larva probably feeds on various low plants.

#### PROTORTHODES RUFULA (Grt.)

Head 2.2 to 2.4 mm. broad. Body about 26 mm. long and 4.5 mm. broad at middle, abdominal segments of about equal width; skin pavement-granulose, roughened by transverse rugae and ill-defined coarse granules; general color dark gray tinged with pink or reddish dorsally and sometimes with a brassy sheen.

Pale middorsal line broken, more distinct toward posterior margin of segments, a subdorsal pale line ventrad of setigerous tubercle II and the subventral pale stripe sometimes indicated. Dorsum including II pale, tinged with pink or reddish extending to III on 8, bearing a segmental series of obscure ovoid dark figures and bordered ventrally by a dark area more intense above and thinning out toward base of prolegs. Spiracles brown with black rim. Cervical shield white with black anterior and lateral margins. Anal shield white with black lateral margins. Setigerous tubercles large, flat, black, I on abdominal segment 1 approximately equal to or smaller than III, the transverse width decidedly less than the space between tubercles I on this segment (12:21). Head pale with well-marked black or brown submedian arcs and reticulation, line of setae P' above apex of front.

Described from many live larvae collected during July and November in sand about various plants in the vicinity of Puyallup, Wash. Larvae collected in July produced moths in August. Moths determined by Schaus.

*Distribution.*—United States: New Mexico, Arizona, California, Nevada, Utah, Oregon, and Washington. Canada: British Columbia.

*Food plants.*—Collected about various low herbs and reared on chickweed, dandelion, and wild mustard. Larvae common under cherry trees at Puyallup, Wash., and reported as feeding on apple, apricot, peach, pear, and plum trees.

#### PROTORTHODES UTAHENSIS (Sm.)

Head 2.5 mm. broad. Body about 25 mm. long and 4.5 mm. broad, broadened somewhat on abdominal segments 7 and 8; skin pavement-granulose; general color dark gray.

Middorsal pale line, subdorsal pale line and pale subventral stripe absent. A segmental series of dorsal, ovoid, rather obscure dark figures on a pale ground extending to ventrad of setigerous tubercle II. Below this a dark area, the dark color becoming gradually more dilute to base of prolegs. Spiracles entirely black. Venter sordid whitish, unmarked. Cervical shield pinkish white with black anterior and lateral margins, the whitish portion broader antero-posteriorly than the black anterior margin. Anal shield pale with a black lateral mark. Setigerous tubercles large, flat, black, I on abdominal segment 1 distinctly smaller than III, the transverse width equal to decidedly less than the space between tubercles I on this segment. Head pale brown with dark submedian arcs reaching apex of the adfrontal areas, absent posteriorly, and close infuscated brown reticulation, the reticulation more or less concealed posterior to the line of P<sup>2</sup> by a brown suffusion, area above antennal insertion of the pale brown ground color, line of setae P<sup>1</sup> above apex of front.

Described from eight mature larvae collected IV.27.38 near Seven Springs Recreation Area 55 miles north of Phoenix, Ariz., among rubbish about filaree (*Erodium cicutarium*). First moth at Puyallup, Wash., IX.10.38. Moths determined by J. F. Gates Clarke.

*Distribution.*—New Mexico, Arizona, California, Utah, Idaho, and Montana.

*Food plants.*—Filaree (*Erodium cicutarium*) and probably many other low plants.

#### PROTORTHODES INCINCTA (Morr.)

Head 2.4 to 2.5 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width; skin pavement-granulose; general color dark gray.

Middorsal pale line indistinct, subdorsal pale line and subventral pale stripe obscure or absent. Dorsum, including setigerous tubercle II, paler than the supraspiracular area, extending to III on abdominal segment 8, and bearing a segmental series of rather obscure, ovoid dark markings. Supraspiracular area darker dorsally, the color thinning out toward the spiracles. Spiracles black. Venter pale. Cervical shield white with black anterior and lateral margins, the black line on posterior margin broken or absent, the dark anterior margin somewhat less broad antero-posteriorly than the pale portion posterior to it. Anal shield white with black lateral margins, not margined with black posteriorly. Setigerous tubercles large, flat, black, I on abdominal segment 1 distinctly smaller than III, the transverse width decidedly less than the space between tubercles I on this segment (13; 25). Head brown with brownish black reticulation, the submedian arcs sometimes absent on occiput, line of setae P<sup>1</sup> above apex of front.

Described from 2 alcoholic larvae from Wichita, Kans., from W. L. Wadley, and 17 larvae, a few of which were alive, collected May 16, 1941, at Champion, Nebr., by C. W. Getzendaner. From this material a moth emerged September 2, 1941. Determined moths submitted by Wadley are in the National Museum.

*Distribution.*—Illinois, Iowa, South Dakota, Nebraska, Kansas, Colorado, New Mexico, and California.

*Food plants.*—Wadley (42) states that alfalfa and probably beans were attacked.

## PROTORTHODES ALFKENI (Grt.)

Head 2.3 to 2.4 mm. broad. Body about 28 mm. long and 4.5 mm. broad, abdominal segments of approximately equal width; skin pavement granulose; general color dark gray.

Middorsal pale line almost entirely absent, subventral pale stripe not developed. Dorsum, including setigerous tubercle II, paler than the suprspiracular area with a segmental series of mid-dorsal dark, oval figures very obscure except posteriorly; II in an obscure, sinuous pale stripe bordered ventrally by an obscure dark stripe which does not tend to form isolated black subdorsal spots opposite I on anterior abdominal segments. Spiracles entirely black. Venter sordid pale, not flecked with white. Cervical shield white often tinged with pink with black anterior and lateral margins, the anterior margin broader antero-posteriorly than the pale area posterior to it. Anal shield white, sometimes tinged with pink, margined laterally but not posteriorly with black. Setigerous tubercles large, flat, black, I on abdominal segment I equal to or smaller than III, the transverse width decidedly less than the space between tubercles I on this segment (13:26). Head pale with dark reticulation, line of setae P<sup>1</sup> above apex of front.

Described from 11 live larvae collected III.20.24.38 about Superior, Ariz., under stones, among dead leaves, and in weed litter. Moths emerged in May 1938 at Puyallup, Wash. Moths determined by J. F. Gates Clarke.

*Distribution*.—Arizona, California, and Utah.

*Food plants*.—No definite food plants are known but larvae were reared on various herbs.

## LACINIPOLIA McD.

1. Cervical shield pavement-granulose or obscurely roughened, without coarse, isolated granules. Crochets unioordinal. Setigerous tubercle II on abdominal segments 8 and 9 not set on an elevation and not surrounded by a row of large, upright white granules..... 2
- Cervical shield with coarse, isolated granules like those on the skin..... 11
2. Skin pavement-granulose, appearing smooth..... 3
- Skin with conspicuous, isolated, coarse, convex granules..... 8
3. Head with coarse, convex granules, at least in the interstices of the reticulation. Third segment of labial palpus half as long as basal segment (7:14)..... 4
- Head pavement-granulose or smooth. Third segment of labial palpus usually one-third as long as basal segment or less..... 5
4. Setigerous tubercles I and II large, sharply defined, broadly convex throughout. Each anterior proleg with about nine crochets in mature larva. Black subdorsal spots present on abdominal segments 1 to 5..... *cuneata*
- Setigerous tubercles I and II small, ill-defined, entirely flat except on abdominal segments 7 and 8. Each anterior proleg with about 20 crochets in mature larva. No black subdorsal spots on abdominal segments 1 to 5..... *patalis*
5. Setigerous tubercles, excepting I and II, large and conspicuous, IV larger than the spiracle. Head nearly entirely smooth..... *meditata*
- Setigerous tubercles small and flat, IV much smaller than the spiracle..... 6
6. Setigerous tubercle I on the abdomen partially surrounded by a black spot. Pale stripe ventrad of II reduced to a line except on median abdominal segments. Subdorsal series of dark spots scarcely indicated. Spiracle on abdominal segment 2 0.23 mm. high (16:70). Setae on abdominal segment 8 tapering to a blunt tip. Adfrontal areas pale apically..... *Lacinipolia* n. sp. (No. 22.1)
- No black spot at setigerous tubercle I. A narrow pale stripe ventrad of setigerous tubercle II. Segmental series of subdorsal dark spots usually distinct on the abdomen..... 7

7. Spiracle on abdominal segment 2 0.18 to 0.20 mm. high (13 to 14:70) in the mature larva. Setae I and II on abdominal segment 8 acute at tip. Adfrontal areas tending to be dark apically (5 out of 6 specimens)----- *vicina*  
Spiracle on 2 0.23 to 0.26 mm. high (16 to 18:70) in the mature larva. Setae I and II on 8 tapering to a blunt tip. Adfrontal areas pale apically (19 specimens)----- *penalis*
8. Head obscurely pavement granulose, appearing smooth. Spiracles brown. Coarse granules present midventrally between prolegs. Distribution limited to areas west of the Rocky Mountains----- *stricta*  
Head with coarse, convex granules, at least in the interstices of the reticulation. Spiracles black or deep infuscated brown----- 9
9. Midventral areas between the prolegs and those including setigerous tubercles VIII on abdominal segments 1, 2, 7, and 8, without coarse granules. A common eastern species, reported west of the Rocky Mountains, from Utah, Arizona, and Nevada----- *renigera*  
Venter bearing coarse granules throughout----- 10
10. Setigerous tubercle IV on abdominal segment 2 decidedly less than the spiracle height removed therefrom (8:14). Rather generally distributed  
Setigerous tubercle IV on abdominal segment 2 approximately the spiracle height (10:11) or slightly more (13:11) removed therefrom. Distribution confined to areas west of the Rocky Mountains----- *comis*  
*olivacea*
11. Abdominal setae I, II, and III sometimes modified, with tips blunt, or flattened and divided into points; IV, V, and VI simple, terete with pointed tip----- 12  
Abdominal setae I to VI modified throughout, flattened and divided apically or bifid to the base----- 14
12. Crochets uniordinal throughout. Abdominal setae I and II modified throughout. Tubercle II very slightly elevated on abdominal segments 8 and 9. Venter paler than the sides----- *Lacinipolia* sp. (No. 24)  
Crochets biordinal medially in the series, at least on anal prolegs. Venter darker than the sides----- 13
13. Abdominal setae terete with pointed tip throughout except II on 8 and 9 which may be modified. Setigerous tubercle II on 8 and 9 very slightly elevated. Distribution limited to areas west of Rocky Mountains.  
*quadrilineata*  
Abdominal setae I and II tending to be modified throughout but this is variable among the individual setae. Tubercle II on 8 and 9 on a short subcylindrical projection. Distribution limited to areas east of the Rocky Mountains----- *laudabilis*
14. Crochets uniordinal throughout. Apical divisions of setae all tending to be of equal length and definitely blunt at tip. Distribution limited to areas west of the Rocky Mountains----- *illaudabilis*  
Crochets biordinal medially in the series, at least on anal prolegs. Tips of setae of a different character. Distribution limited to areas east of the Rocky Mountains----- 15
15. Setae I to VI bifid to the base giving the appearance of two stout, terete, pointed setae arising from each tubercle. Skin with slender papillae, often trifid apically, scattered among the coarse granules. Front with coarse granules----- *implicata*  
Setae I to VI flattened and divided into points apically, the points tending to be of unequal length and pointed at tip. Skin with coarse granules only. Front smooth----- *explicata*

## LACINIPOLIA CUNEATA (Grt.)

Head 2 to 2.3 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, abdominal segments of approximately equal width throughout; skin very finely pavement-granulose, appearing smooth; general color dark gray sometimes suffused with reddish.

Dorsum paler than the supraspiracular area. Middorsal pale line indistinct, margined strongly but narrowly with black at juncture of abdominal segments. A segmental series of dark diamond-shaped figures present at least posteriorly.

Subdorsal pale stripe obscure. Supraspiracular area darkest dorsally where the color is intensified to form a segmental series of black subdorsal spots. Spiracles black, in the dorsal coloration. Subventral stripe made up of pale flecks. Venter of dilute dorsal coloration much flecked with white. Setigerous tubercles large, somewhat elevated, sharply defined, II paler than I, setae stout. Cervical shield pale brown, only the middorsal pale line indicated. Head coarsely granulose, brown, with black or dark brown submedian arcs and full reticulation, the arcs obscure posteriorly.

Described from 10 larvae taken in various stages of development from September to April mostly on the dry, gravelly prairie about Parkland, Wash. A moth emerged indoors April 1, and was determined by Benjamin.

*Distribution*.—United States: Wyoming, California, Oregon, Washington. Canada: British Columbia and Alberta.

*Food plants*.—Probably a general feeder on herbs, but several of the larvae were collected in dried flower parts on *Azalea* and *Rhododendron* shrubs and were reared on this material.

#### LACINIPOLIA PATALIS (Grt.)

Head 2.4 to 2.5 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, abdominal segments of approximately equal width throughout; skin set closely with small, rounded granules; general color dull infuscated brown.

An obscure middorsal pale line, nearly obliterated near the incisures by the dark margining lines. A segmental series of faint, dark, diamond-shaped figures middorsally. A broken, inconspicuous pale line ventrad of setigerous tubercle II. Supraspiracular area to III somewhat darker than remainder of body but without definite subdorsal black spots. A segmental series of dark dashes originating at III and extending obliquely dorsad posterior to II, distinct on segments 6, 7, and 8 only. Spiracles black. Subventral pale stripe represented by a somewhat greater concentration of pale flecks than elsewhere. Venter pinkish brown flecked with white. Setigerous tubercles of moderate size, but slightly elevated, black except II which is often pale. Head with coarse convex granules, brown, the submedian arcs and reticulation dark brown.

Described from many larvae collected in September and October near Puyallup, Wash., from cultivated blackberry by Wm. W. Baker and the writer. These larvae were kept out of doors and continued to feed on foliage of the evergreen blackberry until about the middle of February and a few larvae were still active early in March. Moths emerged, 21 in May and 2 in June, and were determined by Clarke.

*Distribution*.—United States: California and Washington. Canada: British Columbia.

*Food plants*.—Foliage of blackberry, loganberry, and rose and, to some extent, dead fruit bases and dead leaves of blackberry.

#### LACINIPOLIA MEDITATA (Grt.)

Head 2.3 to 2.5 mm. broad. Body about 25 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout to 8; skin finely pavement-granulose; general color dark drab, especially anteriorly, more or less suffused with pinkish especially posteriorly.

Dorsal area pale with a median segmental series of dark ovoid or rhomboidal markings at least posteriorly. Supraspiracular area blackish, intense dorsally on the abdomen except at juncture of segments and gradually more dilute ventrally. Spiracles black. Subventral pale stripe indicated by a somewhat greater concentration of white flecks in this area. Venter sordid, closely flecked with white. Setigerous tubercles I and II rather small, other tubercles large, conspicuous, their setae minute and simple. Head pale yellowish with black submedian arcs and reticulation, sometimes nearly uniformly blackish.

Described from many larvae collected in Tennessee from February to the middle of April. Moths emerge from early in September to the latter part of October. Crumb (19) gives an account of this species with figures.

*Distribution.*—Occurs rather generally from Texas, Kansas, Nebraska, and South Dakota, eastward.

*Food plants.*—Tobacco, clover, *Solidago*, aster, bluegrass, and probably various other plants.

#### LACINIPOLIA n. sp. (No. 22.1)

Head 2.3 to 2.4 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segment 8 slightly broadened; skin set closely with minute rounded granules; general color indefinite dark gray.

Dorsum somewhat paler than the supraspiracular area, with dark strands and flecks on a faintly brownish ground. Middorsal pale line almost obsolete except on the thorax, the margining lines forming a small dark spot at anterior margin of abdominal segments. The segmental series of middorsal diamond-shaped dark figures distinct on abdominal segments 7 and 8 only. Pale stripe immediately ventrad of II reduced to a line except on median abdominal segments where it is reticulate with purple. Ventrad of this a segmental series of small dark spots is faintly indicated on median segments only. Body to base of prolegs, pale flecked with black, no subventral pale stripe. Spiracles black. Venter sordid pale reticulate with white. Setigerous tubercles small, flat, I largely encircled by a black spot. Cervical shield dark with black anterior margin and three pale lines, the broad subdorsal line faintly pink. Head pale brown with strong black submedian arcs and dilute black reticulation.

Described from three larvae collected May 30, 1939, near Tieton, Wash., on the ground beneath *Balsamorhiza*. A moth emerged July 26, 1939, and was determined by Clarke as a new species (specimen numbered 668 in the National Museum).

*Distribution.*—Washington.

*Food plants.*—Reared on low herbs.

#### LACINIPOLIA VICINA (Grt.)

Head 2.2 to 2.4 mm. broad. Body about 25 mm. long and 4.5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin obscurely pavement-granulose; general dorsal color varying from dark gray to soft brown.

Middorsal pale line absent. A segmental series of dark, rhomboidal middorsal figures, often obscure and more distinct posteriorly. Dorsal area to well ventrad of setigerous tubercle II otherwise sharply paler than the supraspiracular area, with two paler spots laterally on abdominal segments 8 and 9. A pale stripe ventrad of II indicated; margined dorsally by a broken dark line and ventrally by a segmental series of rather inconspicuous small black spots. Remainder of body dark owing to blackish reticulation, becoming gradually more dilute ventrally without any trace of a subventral pale stripe. Spiracles black. Setigerous tubercles I and II minute, remainder comparatively large, flat, black. Head pale brown with black submedian arcs and reticulation.

Described from 20 larvae collected near Superior, Ariz., late in March 1938, among dead leaves and other plant debris on the ground. Three moths emerged May 11, 1938, and were determined by Clarke.

*Distribution.*—Occurs generally from Texas, Kansas, and Nebraska, westward; also Manitoba, Canada. Eastern records include: Iowa, Michigan, Pennsylvania, and New York; also Quebec, Canada.

*Food plants.*—Clover, *Haplopappus heterophyllus*, and probably herbs in general.

## LACINIPOLIA PENSILIS (Grt.)

Head 2.2 to 2.5 mm. broad. Body about 25 mm. long and 4.5 mm. broad, abdominal segments of approximately equal width throughout; skin set closely with very small, obscure, rounded granules; general color pale gray to dark gray, sometimes tinged with brownish.

Middorsal pale line sometimes almost continuous, usually very faint or absent. The segmental series of diamond-shaped, dark middorsal figures may be faint or distinct. The same is true of a narrow pale stripe ventrad of setigerous tubercle II, bordered dorsally by a sinuous dark line and flecked with brown or pinkish. Body from subdorsally to base of prolegs with dark reticulation, intensified subdorsally to form a segmental series of more or less distinct, small dark spots and becoming more dilute ventrally, tending to blend with the subventral pale stripe rendering the stripe obscure. Spiracles deep brown or black. Mid-venter dusky. Setigerous tubercles small throughout, II larger than I, flat, black. Head pale brown with black to brownish submedian arcs and reticulation, reticulation often very sparse.

Described from many larvae collected in Washington and Idaho from late in April to early in June. Moths emerged in July and August and were determined by Benjamin and by Clarke.

*Distribution.*—Occurs rather generally from Kansas and Nebraska, westward. The records include: United States: Kansas, Nebraska, Montana, Colorado, Arizona, Utah, Nevada, Idaho, California, Oregon, and Washington. Canada: Manitoba and British Columbia.

*Food plants.*—A general feeder on herbs and has been beaten at night from a considerable variety of shrubs including willow, hazel, wild currant, and antelope-brush (*Kunzia tridentata*).

## LACINIPOLIA STRICTA (Wlk.)

Head 2.1 to 2.2 mm. broad. Body about 24 mm. long and 4 mm. broad at middle, abdominal segments of approximately uniform width throughout; skin bearing coarse, isolated, rounded granules; general color brownish to pale gray.

A strong but sometimes broken pale middorsal line. Median portion of dorsal area occupied by an almost parallel-sided dark stripe instead of a series of oval or rhomboidal markings. Subdorsal pale stripe ventrad of setigerous tubercle II with a median brownish line and set off dorsally by a brown line. Upper portion of supraspiracular area occupied by a nearly parallel-sided black stripe somewhat intensified about midway of each segment and margined ventrally by a broad pale line. Spiracles brown. The pale subventral stripe extending to V. Venter unpigmented, unmarked. Setigerous tubercles of moderate size, but little elevated, dark, setae simple almost pointed apically. Head obscurely pavement-granulose (appearing smooth), pale brown with black submedian arcs and black or brownish reticulation.

Described from 20 larvae collected in Washington from early in May to early in July. Moths emerged from early in July to the last of August and were determined by Heinrich.

*Distribution.*—United States: California, Nevada, Utah, Oregon, Idaho, Montana, and Washington. Canada: British Columbia and Saskatchewan.

*Food plants.*—Strawberry, lettuce, *Eriogonum* sp., and probably various other herbs.

## LACINIPOLIA RENIGERA (Steph.)

Head 2.3 to 2.4 mm. broad. Body about 25 mm. long and 4.5 mm. broad at middle, tapering slightly posteriorly; skin bearing coarse, isolated, elevated granules; general color pale grayish.

Dorsal area pale including a median dark band constricted at juncture of segments to form a series of rhomboidal or ovoid figures. Subdorsally an inconspicuous, narrow, pale stripe more or less flecked with ferruginous or brownish.

Upper half of a supraspiracular area including a prominent, continuous, black stripe, lower half blackish much flecked with white. Spiracles dark brown. A well-defined pale subventral stripe. Venter sordid, flecked with white. Setigerous tubercles of moderate size, the dorsal subconical, inconspicuous, pale, their setae heavy, simple. Head coarsely granulose, grayish brown, the black submedian arcs and reticulation almost obscuring the ground color dorsally.

Described from many larvae collected in Tennessee. There are two broods, mature larvae being found from the latter part of March to the latter part of May and again in July and August. Crumb (19) gives an account of this species with figures.

*Distribution.*—Occurs in the United States from Kansas, Nebraska, and North Dakota, eastward with North Carolina, Tennessee, and Arkansas at approximately the southern limit; in Arizona, New Mexico, Colorado, Utah, Nevada, and Montana in the west, and in all of the adjacent Provinces of Canada. The writer has never seen a larva from west of the Rocky Mountains.

*Food plants.*—A general feeder on apple, cottonwood, grape, and many species of herbaceous plants.

#### LACINIPOLIA OLIVACEA (MOFF.)

Head 2 to 2.2 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, abdominal segments of approximately equal width throughout to 8; skin bearing coarse, elevated, isolated granules; general color light gray to brownish.

Dorsum paler than the supraspiracular area, tinged with brown, with an obscure median pale line in a dark stripe somewhat constricted at the incisures but scarcely forming a segmental series of rhomboidal figures. A brownish line through setigerous tubercle II, ventrad of which is a narrow pale stripe including a brownish line. Supraspiracular area darkest dorsally with more or less definite black spots. Spiracles black. A broad pale subventral stripe extending to V. Venter to base of prolegs dusky, paler midventrally. Setigerous tubercles large, dark, nearly flat, the setae short, stout, simple. Head coarsely granulose in the interstices of the reticulation, with more or less distinct dark submedian arcs and black or brown reticulation.

Described from numerous larvae collected in Washington from May 25 to June 26. Moths emerged from July 3 to August 9 and were determined by Clarke. A captured moth deposited eggs VII.3.35 which hatched VII.10.35. Some of the larvae were mature September 4, 1935, and the first moth emerged November 3, 1935. This seems to indicate that there is a second brood in this species.

*Distribution.*—Occurs generally in the United States west of the Rocky Mountains; in Nebraska, Iowa, North Carolina, Pennsylvania, New York, New Hampshire, and Maine in the east, and in all of the adjacent Provinces of Canada.

*Food plants.*—Clover, grass, and probably various herbs.

#### LACINIPOLIA COMIS (Grt.)

Head 2 to 2.1 mm. broad. Body about 25 mm. long and 5 mm. broad at middle, abdominal segments of approximately uniform width throughout; skin bearing coarse, irregular, rounded granules; general color varying from drab gray to very pale gray, the dorsum often brownish.

Mid-dorsal pale line slender, usually continuous but subdued, the dark margining lines intensified at the incisures. Segmental series of rhomboidal, dark mid-dorsal figures obscure or absent, the dorsal area margined by a narrow white stripe ventrad of setigerous tubercle II, set off dorsally by a brown line. Supraspiracular area dark dorsally, pale ventrally, the dorsal portion a narrow black stripe broadened medially on each segment to form a black spot, the series margined ventrally by a sinuous pale line. Spiracles black. A broad, subdued white

subventral stripe reticulate with brown and including setigerous tubercle V. Venter dusky, flecked with white or unmarked. Setigerous tubercles slightly convex or flat, black except II paler than I, setae tapering to a blunt simple tip. Head coarsely granulose, brown, with brown or black submedian arcs and reticulation.

Described from 12 larvae collected in Washington from early in May to the latter part of June. Moths emerged from June 27 to July 24 and were determined by Clarke.

*Distribution.*—United States: Colorado, Utah, Oregon, and Washington. Canada: British Columbia and Saskatchewan.

*Food plants.*—A general feeder on herbs.

#### LACINIPOLIA sp. (No. 24)

Head 2 to 2.1 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, abdominal segments of approximately uniform width to 8; skin bearing coarse upright granules; general color dark gray.

Dorsum somewhat darker than the supraspiracular area. Middorsal pale line obsolete except near juncture of segments. A segmental series of distinct, dark rhomboidal figures middorsally. A sinuous pale line including setigerous tubercle II. A subdorsal white line margined dorsally by an indefinite dark line. The usual segmental series of subdorsal black spots, reduced to oblique black lines on 7 and 8. Ventrad of these black spots body is uniformly rather dark to base of prolegs with an obscure, sinuous pale line in the line of the spiracles. No subventral pale stripe. Spiracles black. Midventer paler than the sides. Setigerous tubercles small, II on 8 and 9 very slightly elevated and tending to be surrounded by a group of large, scattered, white granules. Cervical shield bearing coarse granules. Head coarsely granulose, brown with black submedian arcs and reticulation.

Described from five larvae collected near Superior, Ariz., late in March 1938. No moths were reared. This species is nearly black in earlier instars.

*Distribution.*—Arizona.

*Food plants.*—Unknown.

#### LACINIPOLIA QUADRILINEATA (Grt.)

Head 2.1 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, abdominal segments of approximately uniform width throughout; skin bearing coarse, elevated, bluntly pointed granules, pale in pale areas, black elsewhere; general color sordid dust gray to light gray.

Middorsal pale line broken, inconspicuous except on abdominal segment 9. A segmental series of obscure, slightly darker diamond-shaped middorsal figures margined by a pale line ventrad of setigerous tubercle II. Supraspiracular area darker dorsally with a series of dark subdorsal spots, the spots oblique and linear on 7 and 8. Spiracles black. No subventral pale stripe. Venter darker than the dorsum. Setigerous tubercles small, II on 8 on a very slight elevation and surrounded by a row of coarse, upright, sordid to white granules. Cervical shield bearing coarse granules. Head coarsely granulose, pale with black submedian arcs and reticulation.

Described from 20 larvae collected near Superior, Ariz., the latter part of March 1938. Moths emerged the latter part of May and were determined by Clarke.

*Distribution.*—California, Arizona, New Mexico, Nevada, and Oregon.

*Food plants.*—Taken among dead leaves and other plant debris about clover, *Haploppappus heterophyllus*, and other herbs.

## LACINIPOLIA LAUDABILIS (Gr.)

Head 2.1 to 2.2 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, abdominal segments of nearly equal width throughout; skin bearing coarse upright corrugated granules, white in pale areas and darker elsewhere; general color yellowish gray, the thorax more gray than the abdomen and the venter distinctly darker than the dorsum.

Dorsal area lighter than the sides with traces of a middorsal pale line margined with black at juncture of segments and with faint indications of a segmental series of diamond-shaped dark markings margined laterally by a narrow yellowish stripe outlined by fine brownish lines. Immediately ventrad a segmental series of dark spots, less definite on thorax and posteriorly on the abdomen. Remainder of supraspiracular area somewhat more gray and merged with the yellowish, indefinite subventral stripe. Spiracles black. Venter abruptly darker than the sides. Setigerous tubercles of moderate size, black. Cervical shield bearing coarse granules like those on the skin. Head obscure yellowish, coarsely granulose, with black submedian arcs and reticulation.

About 25 alcoholic larvae collected at Oxford, N. C., in February and March 1932 on the ground about low plants by J. U. Gilmore have been examined, but the description and determination are based on a few live larvae collected in February 1924 at A. & M. College, Mississippi, by H. W. Allen. From these Mississippi larvae two moths emerged late in April 1924 and were determined by Schaus (Moths No. 11 and 13, U. S. National Museum).

*Distribution.*—Probably limited to areas east of the Great Plains. The accepted records include: Texas, Florida, Arkansas, Missouri, Mississippi, Alabama, Georgia, South Carolina, North Carolina, Ohio, Pennsylvania, Maryland, New Jersey, and New York.

*Food plants.*—Probably a general feeder on herbs. The Mississippi specimens were feeding on mustard, and the North Carolina larvae were found about low plants in a yard.

## LACINIPOLIA ILLAUDABILIS (Gr.)

Head 2.2 mm. broad. Body about 23 mm. long and 4 mm. broad at middle, abdominal segments of about equal width throughout; skin bearing coarse, corrugated black and white granules; general color gray.

An obscure middorsal pale line. A segmental series of obscure rhomboidal middorsal dark figures. A pale line well ventrad of setigerous tubercle II margined ventrally by a segmental series of small black spots modified to form obliquely transverse black lines on abdominal segments 7 and 8. The subdorsal black spots in dorsal margin of an obscure dark stripe strongly sinuate on ventral margin where it is margined by a black line. Spiracles black, in the ventral loops of the dorsal coloration. An obscure pale subventral stripe strongly sinuous on dorsal margin. Venter blackish. Setigerous tubercles small, black, I and II nearly flat except II on 8 and 9 where the tubercle is at the apex of a low but subcylindrical projection margined apically by a row of conspicuous white granules; setae dark brown, short, all modified except on tubercles VII and VIII, stout, flattened and broadened toward the apex and divided apically, the divisions all tending to be of equal length and definitely blunt at apex. Cervical shield coarsely granulose like the skin. Head coarsely granulose, brown with close black reticulation.

Described from one larva collected 1 mile west of Lyle, Wash., May 9, 1946, at base of lupine by J. F. Gates Clarke. The moth emerged August 6, 1946, and was determined with some question as *Lacinipolia illaudabilis* var. *albo guttata* (Gr.) by Heinrich. A larva, apparently

the same, was collected May 21, 1949, near Richland, Wash., among plant debris under sagebrush.

*Distribution*.—Texas, New Mexico, Arizona, Colorado, Utah, Nevada, California, Montana, and Washington; also British Columbia.

*Food plants*.—Unknown.

#### LACINIPOLIA IMPLICATA McD.

Head 2.2 mm. broad. Body about 24 mm. long and 4 mm. broad at middle, abdominal segments of approximately equal width throughout; skin bearing coarse granules interspersed with coarse setiform granules almost in the form of pubescence, the granules often divided into 3 apically; general color rather dark gray.

Dorsum somewhat paler than the supraspiracular area. No trace of a middorsal pale line. A segmental series of diamond-shaped dark figures faintly indicated, bordered laterally by a pale line. Supraspiracular area darker dorsally and fading out to the spiracles, with a segmental series of black bars arising above III and extending obliquely posterior to II. Spiracles black. Subventral pale stripe ill-defined dorsally, more distinct ventrally. Venter dark with pale flecks. Setigerous tubercles large, pale, with dark areas about the setal insertions, II on abdominal segments 8 and 9 borne on a conspicuous cylindrical projection margined apically by coarse upright granules; all tubercles but VII and VIII with their setae bifid from the base giving the appearance of two stout terete, pointed setae arising from each tubercle. Cervical shield pinkish, coarsely granulose. Head coarsely granulose, with black submedian arcs and reticulation.

Described from one larva collected on Spring Creek near Ringold, Wash., April 20, 1930, among dead leaves by J. U. Gilmore. A moth emerged October 11, 1930, and was included in his paratype series by Dr. McDunnough.

*Distribution*.—Texas, Tennessee, North Carolina, Maryland, New Jersey, Pennsylvania, and Michigan.

*Food plants*.—Feed to some extent on both dead leaves and herbs.

#### LACINIPOLIA EXPLICATA McD.

Head 2.2 mm. broad. Body about 21 mm. long and 4.5 mm. broad, abdominal segments of approximately uniform width throughout; skin bearing coarse, elevated granules; general color dark gray.

Middorsal pale line absent except near juncture of segments where it is margined by black lines. Dorsal area dull yellowish, without diamond-shaped segmental markings, margined by a narrow stripe ventrad of setigerous tubercle II and limited dorsally by a dark line. Supraspiracular area with a segmental series of black spots dorsally, modified to form oblique dashes on abdominal segments 7 and 8, paler ventrally to the spiracles. Spiracles black. Venter of dorsal color. Setigerous tubercles small, black but slightly elevated except II on 7 and 8 where the tubercle is borne on a subcylindrical projection margined apically by coarse upright granules; setae short, stout, clavate, and divided apically forming pointed spines of various lengths. Cervical shield bearing coarse granules. Head coarsely granulose, with black submedian arcs and reticulation.

Described from two larvae collected on the Lafayette pike near New Providence, Tenn., March 4, 1919, in an old clover field. A moth emerged April 24, 1919, and was included in his paratype series by Dr. McDunnough.

*Distribution*.—Texas, Arkansas, Georgia, Tennessee, North Carolina, Kentucky, and Maryland.

*Food plants*.—Larvae were reared on clover but food selected in nature is not known.

## LASIONYCTA Auriv.

1. Skin smooth. Head nearly uniformly blackish with black freckles faintly visible. Length of spinneret equal to three times the median width. The row of setae above emargination in labrum slender, setiform. Lateral and ventral setigerous tubercles moderately large. Spinneret with an apical silk pore..... *perplexa*  
 Skin minutely pubescent. Head pale or brownish with darker freckles. Spinneret, at most, but slightly longer than broad. The row of setae above emargination in labrum short, stout, spurlike. Setigerous tubercles minute throughout. Spinneret without an apical silk pore..... 2
2. Prolegs normal. General color of dorsum pinkish..... *arietis*  
 Prolegs obsolescent, turned backward, fused with the body and without crochets. (A few crochets are present in earlier instars.) General color of dorsum whitish..... *wyatti*

## LASIONYCTA PERPLEXA (Sm.)

Head 2.2 to 2.4 mm. broad. Body about 32 mm. long and 5 mm. broad, abdominal segments of approximately equal width throughout to 8; skin smooth; dorsum soft dusky brown sides sharply and distinctly darker.

Middorsal pale line very faint, obliterated by a small black area at juncture of segments. Subdorsal pale line subdued, much stronger than the middorsal and almost continuous. Dorsum uniform dusky brown without markings. Sides to base of prolegs blackish becoming slightly more dilute ventrally and entirely without a subventral pale stripe or other markings. Spiracles deep, dusky brown. Midventer sordid gray without markings. Setigerous tubercles moderately large, flat, black. Cervical shield black with three white lines. Head pale laterally, uniformly suffused with fuscous dorsally, with dark freckles faintly visible, no submedian arcs or reticulation.

Described from six larvae collected in Washington in Rainier National Forest, at Hell's Crossing Camp, and near Mount Adams late in April by Joseph Wilcox and the writer. Two moths emerged late in June and were determined by Clarke. (Moths No. 306 and 307, U. S. National Museum.)

*Distribution.*—United States: Colorado, Montana and Washington. Canada: British Columbia and Alberta.

*Food plant.*—Alder.

## LASIONYCTA ARIETIS (Grt.)

Head 2.4 to 2.6 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering posteriorly; skin with very short, minute pubescence; general dorsal color pinkish.

Pinkish to somewhat dorsad of setigerous tubercle III with but faint traces of a middorsal pale line and a strong white subdorsal stripe just ventrad of II, ventrad of which the pink is more intense. Including III and the spiracles whitish. Spiracles brown to deep infuscated brown. Subventral pale stripe rather indefinite. Venter sordid gray, unmarked. Setigerous tubercles minute. Cervical shield pale infuscated brown. Prolegs normal. Head pale with pale brown freckles.

Described from many larvae collected in Washington and Oregon in May from sand dunes on ocean beaches. Moths have emerged in July and August and were determined by Benjamin.

*Distribution.*—Washington, Oregon, and California (larvae).

*Food plants.*—Beach pea (*Lathyrus littoralis*), beach buckwheat (*Polygonum paronychia*), beach verbena (*Abronia latifolia*), and a slender grass which roots at the nodes. The beach buckwheat and grass are cut off at or below the surface of the sand.

## LASIONYCTA WYATTI B. &amp; B.

Head 2.5 to 3.1 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering posteriorly; skin bearing very short, minute pubescence; general color white or sordid gray.

Dorsum to dorsad of setigerous tubercle III slightly yellowish or brownish, remainder of body white. Middorsal and subdorsal pale lines and abventral pale stripe nearly or quite absent. An indefinite dusky stripe midway between II and III and a dusky line just ventrad of the spiracles. Spiracles dark brown. Setigerous tubercles minute. Cervical shield white. Prolegs obsolescent, turned backward, fused to the venter and without crochets except in early instars. Head pale brownish with inconspicuous darker brown freckles posteriorly.

Described from many larvae collected on coastal sand dunes in Washington and Oregon in May, September, and December. Moths emerged in June, July, and September and were determined by Benjamin. Larvae in various stages apparently are present throughout the year. A large larva was collected September 26, 1932, and remained active and fed until August 8, 1933, when it pupated. The moth emerged September 7, 1933, in the laboratory.

*Distribution.*—Washington and Oregon.

*Food plants.*—Beach buckwheat (*Polygonum paronychia*), beach verberna (*Abronia latifolia*), seaside tansy (*Tanacetum ccmphorum*), and a slender grass which roots at the nodes.

## GENUS No. 7

## "POLIA" DETRACTA (Wlk.)

Head 2.6 to 2.8 mm. broad. Body about 22 mm. long and 4 mm. broad at middle, abdominal segments 7 and 8 rather strongly broadened; skin smooth with a silky sheen; general color dark brown flecked with white.

Dorsal area brown with a pale middorsal line obsolete except at the extremities and with triangular pale areas on posterior half of segments next to the pale subdorsal line. Supraspiracular area darker dorsally growing gradually more speckled and pale ventrally. Spiracles pale yellowish. A pale subventral stripe. Venter dilute brownish flecked with white. Setigerous tubercles moderately large, flat. Cervical shield polished black with three strong pale lines, the part ventrad of the subdorsal pale line brown. Anal shield brown with a black median area cut by the pale middorsal line. Head brown, the front and laterally to the ocelli uniform dusky gray; dark submedian arcs and reticulation present.

Described from 17 larvae collected in Tennessee during February and March by J. U. Gilmore, Joe Milam, and the writer. Two moths emerged early in June and were determined by McDunnough.

*Distribution.*—Occurs generally in the United States east of the Mississippi River; in North Dakota and Montana in the west, and in all the adjacent Provinces of Canada.

*Food plants.*—Buds of oak. Phipps (36) lists gray birch (*Betula populifolia*), blueberry (*Vaccinium*), serviceberry (*Amelanchier*), and dandelion as food plants.

## GENUS No. 3

## SPECIES No. 23

Head 2.6 mm. broad. Body about 26 mm. long and 4 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color blackish, dull greenish ventrally.

Middorsal and subdorsal pale lines and subventral stripe nearly or quite absent. Dorsum to somewhat ventrad of setigerous tubercle II an obscure brown

with a broad dark median stripe somewhat constricted at juncture of abdominal segments. From the margin of the dorsal coloration to and including the spiracles nearly black, the shade darkest dorsally. Spiracles a clear decided brown. Venter dull, dusky greenish, the green more distinct midventrally. Setigerous tubercles large, black, nearly flat. Head smooth, dilute brown with distinct dark submedian arcs, the reticulation absent except next to the submedian arcs on occiput; length of median line much less than height of front, occipital angle acute.

Described from two larvae collected in Sunrise Park (Yakima Park), Mount Rainier, August 14, 1931, by Joseph Wilcox and the writer. No moth was reared.

*Distribution*.—Washington.

*Food plant*.—*Potentilla* sp.

### LASIESTRA Hamp.

#### LASIESTRA sp. (No. 25)

Head 2.4 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, abdominal segments of approximately equal width throughout to 8; skin smooth; general color blackish.

Blackish to well ventrad of the spiracles, the dark color somewhat dilute in ventral portion of suprspiracular area, the venter pale. No pale middorsal or subdorsal lines or subventral stripe. An obscure pale area posterior to setigerous tubercle II on abdominal segments. The dark color intensified in a series of middorsal spots at anterior margin of abdominal segments, in an obscure spot including I and II and in a spot dorsad of III. Spiracles black. Setigerous tubercles black, moderately large, slightly convex. Head black with a pale area posterior to the ocelli.

Described from five larvae collected on Mount Rainier at an elevation of 8,000 feet, June 29, 1930, by C. W. Getzendaner, on a rocky ridge free of snow. The larvae were active during the day in this region of perennial freezing cold at night. Two moths emerged late in July at Puyallup, Wash., and were determined as *Lasiestra* n. sp. by Heinrich. (Moths No. 19 and 20, U. S. National Museum.)

*Distribution*.—Washington.

*Food plant*.—*Polemonium elegans*.

### XANTHOPASTIS Hbn.

#### XANTHOPASTIS TIMAIS (Cram.)

Head 3.3 to 3.6 mm. broad. Body about 47 mm. long and 6.5 mm. broad, abdominal segments of approximately uniform width throughout; skin smooth; coloration consisting of transverse black and white stripes of variable width.

Middorsal white line represented, at least posteriorly, by a white dot near anterior margin of segments. Transverse white stripe at posterior margin of segments connected angularly to a linear transverse, white mark anterior to the spiracle. Spiracles black. Venter more or less black and tinged with orange. Anal shield, prolegs and legs orange. Setigerous tubercles moderately large. Cervical shield black. Head orange brown with a black spot at the ocelli and another opposite apex of front.

Described from numerous larvae collected in Tennessee and Florida. The Tennessee larvae were taken the latter part of August and six moths emerged the latter part of September. Moths were determined by Dyar.

*Distribution*.—Mexico, Texas, Florida, Georgia, Tennessee, and North Carolina.

*Food plants*.—Spiderlily (*Hymenocallis occidentalis*), *Amaryllis*, and *Narcissus*.

## SCOTOGRAMMA Sm.

## SCOTOGRAMMA TRIFOLII (Rott.)

Head 2.7 to 2.8 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, abdominal segments of approximately uniform width to 8; skin smooth; general color usually dusky green but varying to pale brown, yellowish, or gray in some individuals.

In a great majority the dorsum is dusky green composed of a mixture of white and blackish reticulation on a green ground, the dorsum slightly darker than the supraspiracular area which is of nearly uniform color, excepting small black spots at the spiracles in well-marked specimens. In addition the following details may be present: A slender, broken white or yellowish middorsal line margined by a dark shade. A segmental series of linear black spots anterior to setigerous tubercle II margined ventrally by a white or yellowish stripe which continues upon the anal shield. Spiracles white. A broad white subventral stripe tinged medially with yellowish or pinkish. Venter green flecked with white. Setigerous tubercles minute. Head variable in color and markings, conspicuously freckled with black in earlier instars.

Described from many larvae collected in Washington in September and October by A. R. Rolfs and the writer. Moths emerged in April and May of the following year and were determined by Benjamin. There are said to be three broods in this species.

*Distribution.*—Occurs generally across the United States north of the southern boundaries of Virginia, Kentucky, Missouri, Texas, New Mexico, Arizona, and California; in all of the adjacent Provinces of Canada, and in Alaska.

Food plants.—Russian thistle (*Salsola kali*), sugar beet, lambs-quarters (*Chenopodium*), tobacco, and probably many other plants.

## MIODERA Sm.

## MIODERA STIGMATA Sm. (?)

Head 3 to 3.2 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color green, but Comstock and Dammers (12) state that the larva also occurs in a brown phase.

The dorsal ground color more or less overlaid by dark strands and flecks to the spiracles except as indicated. A middorsal white stripe sometimes broken at the incisures through fusion of the margining dark lines. A white stripe just ventrad of setigerous tubercle II, margined dorsally by a dark line which tends to form linear dark spots anterior to II. A white line in the line of III. Spiracles white, in the dorsal coloration. A broad white stripe ventrad of the spiracles. Venter green. Setigerous tubercles minute. Head green with inconspicuous brown freckles, otherwise unmarked.

Described from 12 larvae collected July 26, 1940, near Naches, Wash. Determination based on the illustrated account by Comstock and Dammers (12).

*Distribution.*—California and Washington.

*Plant food.*—Sagebrush (*Artemisia*).

## ZOSTEROPODA Grt.

## ZOSTEROPODA HIRTIPES Grt.

Head 1.9 to 2.1 mm. broad. Body about 27 mm. long and 3.5 mm. broad at middle, tapering posteriorly; skin smooth; general color an inconspicuous gray.

Dorsum somewhat paler than the supraspiracular area, flecked sparsely with black. A continuous, pale middorsal line margined by dark flecks intensified and diffused posteriorly forming a dark stripe. Indefinite white lines ventrad of

setigerous tubercles II and III. A dark stripe in the line of the spiracles, broader and more intense on posterior abdominal segments. Spiracles white. A strong white subventral stripe, pinkish medially and extending to V. An obscure dark stripe dorsad of VI. Venter white reticulate with blackish and pink. Setigerous tubercles obscure but moderately large, flat. Head pale with nearly straight black submedian arcs more intense at their margins, bordered laterally by a white stripe and with a little dark reticulation laterally.

Described from 27 larvae collected in Washington in September and October. Moths emerged in June of the following year and were determined by Clarke.

*Distribution.*—United States: California, Colorado, Oregon, Idaho, Montana, and Washington. Canada: British Columbia and Saskatchewan.

*Food plants.*—Most larvae have been swept from low herbage at night, and they have been reared on false dandelion (*Hypchoeris radicata*), clover, *Aster*, and grass, but a few larvae have been beaten from trees, including willow and alder.

### ANARTA Ochs.

#### ANARTA MYRTILLI (L.)

Head 2 to 2.2 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, of about equal width throughout with a slight dorsal hump on abdominal segment 8; skin smooth; general color indeterminable.

A middorsal dark shade including the white middorsal line which is strong near juncture of segments and absent elsewhere. A slender, broken white line including setigerous tubercle I. A dark shade immediately ventrad of setigerous tubercle II bearing a sinuous white line strong near juncture of segments and absent elsewhere. Spiracles brown with black rims, set in a sinuous dark stripe bordered ventrally by a sinuous white line. A sinuous white line along base of prolegs and 2 midventral white lines. Setigerous tubercles dark, flat, inconspicuous, the setal insertions black. Head pavement granulose, these granules interspersed with groups of coarse convex granules, brownish with inconspicuous brown freckles, the setal insertions black.

Described from three inflated larvae from Germany, without data.

*Distribution.*—Labrador and Greenland.

*Food plant.*—Heather (*Calluna vulgaris*).

### ORTHODES Gn.

#### ORTHODES CRENULATA (Butl.)

Head 2.3 to 2.6 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, broadened on metathorax and on abdominal segments 1, 2, and 8; skin smooth; general ground color pale gray or light brownish overlaid sparsely dorsally and rather uniformly and strongly elsewhere with black flecks.

Middorsal pale line narrow and broken, obliterated at anterior margin of abdominal segments by a small but conspicuous black spot. Subdorsal pale line somewhat sinuous and tending to be more distinct at middle of segments. A segmental series of subdued, dark, V-shaped dorsal figures, the arms arising subdorsally and extending obliquely dorso-posteriorly between setigerous tubercles I and II with the apex at the middorsal black spot on the succeeding segment. Spiracles dark brown or black. Subspiracular pale stripe obscure, indicated by pale, broken marginal lines. Midventer of dilute dorsal coloration. Setigerous tubercles minute. Head brown, submedian arcs nearly obsolete, reticulation nearly entirely absent, with a straight black stripe arising above antennal insertion and broadening to posterior margin.

Described from many larvae collected in Tennessee. Mature larvae were collected in April, June, July, September, October, and Novem-

ber, and moths emerged in April, May, June, July, and August. Moths determined by Dyar.

*Distribution*.—Occurs generally in the United States from Texas, Kansas, and Nebraska, eastward, except that there are no records for the area south of North Carolina, Tennessee, and Missouri. Occurs also in Manitoba, Canada.

*Food plants*.—Jewel weed (*Impatiens*), *Aster ericoides*, tobacco, and willow.

#### PSEUDORTHODES Morr.

Spiracles small, setigerous tubercle III on abdominal segment 2 at least nearly twice the spiracle height removed therefrom. (Average of 10 specimens 28:13.) Without a red line ventrad of the ocelli. Distribution limited to areas west of the Rocky Mountains.----- *irrorata*

Setigerous tubercle III on abdominal segment 2 but little more than the spiracle height removed therefrom. (Average of 10 specimens 26:21.) With a red line ventrad of the ocelli except that it includes ocellus VI. Distribution limited to areas east of the Rocky Mountains.----- *vecors*

#### PSEUDORTHODES IRRORATA (Sm.)

Head 2.1 to 2.2 mm. broad. Body about 28 mm. long and 4 mm. broad at middle, broadened on abdominal segments 7 and 8; skin smooth; general color varying through pale yellowish and brownish to almost black.

The pale markings may be gray, yellow, or orange. Middorsal pale line obscure. The pale, somewhat broken subdorsal line intensified as a white or yellowish dot on some anterior abdominal segments. A segmental series of dark, rhomboidal, dorsal spots on the abdomen. Supraspiracular area darkest dorsally and sometimes with a sinuous black stripe including the spiracles. Spiracles dark brown or black. A broad, subdued pale subventral stripe. Venter to the prolegs of dorsal coloration, midventer pale with dark reticulation. Setigerous tubercles minute. Head brownish closely freckled with black on posterior half, a black stripe originating above the antennal insertion and broadening to posterior margin among the intervening black freckles.

Described from many larvae collected in Washington in April and May. Moths emerged in May and June and were determined by Heinrich.

*Distribution*.—United States: California, Nevada, Oregon, and Washington. Canada: British Columbia.

*Food plants*.—Indian-plum (*Osmaronia cerasiformis*), snowberry (*Symphoricarpos*), ferns, and young larvae are common on dead brake (*Pteris*) in the fall.

#### PSEUDORTHODES VECORS (Gn.)

Head 2.1 to 2.2 mm. broad. Body about 25 mm. long and 4.5 mm. broad at middle, broadened on abdominal segments 7 and 8; skin smooth; general color dark gray.

Dorsum of abdomen to ventrad of setigerous tubercle II paler than the sides, the pale coloration much obscured by a segmental series of dark rhomboidal figures. Inconspicuous middorsal and subdorsal pale lines margined by irregular black lines. Supraspiracular area dark to and including the spiracles. Spiracles black. A subventral pale stripe extending ventrally to V. Venter pale, much flecked with black. Setigerous tubercles minute. Head gray, a dusky shade and a few dark freckles margining the median line, a dark stripe, composed of black freckles, arising above the antennal insertion and broadening to posterior margin, a red line ventrad of the ocelli except that it includes ocellus VI.

Described from 15 larvae collected in Tennessee in October 1927 and compared with determined specimens in the U. S. National Museum. Moths are said to be found in May and August.

*Distribution.*—United States: Tennessee, North Carolina, Virginia, Maryland, New Jersey, Pennsylvania, Massachusetts, New York, New Hampshire, Iowa, and Wisconsin. Canada: Quebec and Nova Scotia.

*Food plants.*—Jewel weed (*Impatiens*) and *Aster ericoides*.

### LOPHOCERAMICA Dyar

#### TRICHOLITA Grt.

1. Spiracles white. Feeds on elder (*Sambucus*). Recorded from Arizona, California, and Montana.----- *Lophoceramica artega*  
Spiracles black or brown. Feed on herbs. Some of the species of much wider distribution.----- 2
2. Ground color of head pale brownish, not overlaid with infuscation. Distribution limited to areas west of the Rocky Mountains.----- *Tricholita chipeta*  
Ground color of head a decided brown overlaid with infuscation. Distribution limited to areas east of the Rocky Mountains.----- 3
3. Setigerous tubercle I on the abdomen minute, a mere setal insertion except on abdominal segment 9. Dark reticulation of body dense dorsally and much more sparse toward the spiracles. Head uniformly infuscated.-----  
*Tricholita notata*  
Setigerous tubercle I on abdomen moderately large. Dorsum paler than the supraspiracular area except in a dark shade margining the middorsal line. Head heavily infuscated on the occiput.----- *Tricholita signata*

### LOPHOCERAMICA Dyar

#### LOPHOCERAMICA ARTEGA (Barnes)

Head 3 mm. broad. Body about 35 mm. long and 6 mm. broad, heavy-bodied and somewhat broadened on abdominal segments 7 and 8; skin smooth; general color dull brownish tinged faintly with purplish.

Middorsal and subdorsal pale lines and subventral stripe obscure or absent, the middorsal line in an obscure dark area somewhat intensified at juncture of segments. Coloration to the spiracles otherwise composed of black reticulation on a dull brownish ground, the reticulation more concentrated on posterior third of abdominal segments dorsally and in a stripe dorsad of III. Spiracles white. Venter sordid gray, tinged with purplish and flecked with white. Setigerous tubercles I and II on the abdomen minute except on 9; III, IV, V, and VI moderately large, flat, brown. Cervical shield brownish. Head smoky brown with small dark freckles.

Described from two larvae collected in Arizona, one late in April and the other early in May. A moth emerged August 31, 1938, at Puyallup, Wash., and was determined by Clarke.

*Distribution.*—Arizona, California, and Montana.

*Food plant.*—Elder (*Sambucus*).

#### TRICHOLITA CHIPETA Barnes

Head 2.8 to 3 mm. broad. Body about 25 mm. long and 4.5 mm. broad, abdominal segment 8 slightly broadened; skin smooth; general color dull gray to obscure brownish.

Dorsum including setigerous tubercle II paler than the supraspiracular area, including an obscure pale middorsal line margined by a diffuse dark area more intense posteriorly. Pale line ventrad of II irregular and obscure. Supraspiracular area including the spiracles, dull blackish, darker in dorsal third. Spiracles dark brown. Subventral pale stripe extending to V, distinct but not conspicuous. Venter to base of prolegs of dilute dorsal coloration, sordid gray midventrally. Setigerous tubercle I minute except on abdominal segment 9; III, IV, V, and VI sometimes moderately large. Cervical shield pale brownish flecked with black. Head pale brownish closely freckled with black.

Described from numerous larvae collected in Arizona late in March and in April 1938 by K. B. McKinney and the writer. Moths emerged in September and October at Puyallup, Wash., and were determined by Clarke. The larvae conceal themselves among rubbish about the base of their food plant and sometimes spin an abundance of silk about their retreat.

*Distribution.*—Arizona, New Mexico, Colorado, and Utah.

*Food plant.*—Snakeweed (*Gutierrezia wrightii*).

#### TRICHOLITA NOTATA Stkr.

Head 2.8 mm. broad. Body about 27 mm. long and 5.5 mm. broad at middle, abdominal segments 7 and 8 broadened; skin smooth; general color "gray with a reddish brown tint" (A. Herz).

Dorsum reticulate with blackish, dense dorsally and becoming much more sparse toward the spiracles. Middorsal and subdorsal pale lines obscure or absent. Spiracles brown. Subventral pale stripe indefinite. Venter pale with a few dark flecks and apparently tinged with pink. Setigerous tubercle I minute except on abdominal segment 9, tubercles II to VIII moderately large, flat, black. Cervical shield brown. Head brown overlaid uniformly with infuscation through which numerous black freckles are visible.

Described from two alcoholic larvae collected near Chicago, Ill., June 10, 1936, by A. K. Wyatt.

*Distribution.*—Iowa, South Dakota, and Illinois.

*Food plant.*—Stiff goldenrod (*Solidago rigida*) (teste Wyatt).

#### TRICHOLITA SIGNATA (Wlk.)

Head 2.9 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, broadened across abdominal segments 7 and 8; skin smooth; general color pale brown.

Dorsum to and partially including the spiracles sparsely reticulate with blackish on a brown ground, the dorsum to setigerous tubercle II paler than the supra-spiracular area. The broken pale middorsal line with a broad dark margin. An inconspicuous, broken pale line ventrad of II. Spiracles dark brown. Venter pale flecked with white. Setigerous tubercles moderately large throughout, flat, black. Cervical shield brown. Head brown, much infuscated dorsally with numerous dark freckles.

Described from one inflated larva labeled "Green Village, N. J., June 30" received through the kindness of Charles Rummel. Moths are said to emerge in August.

*Distribution.*—United States: Colorado, Nebraska, Arkansas, Missouri, Illinois, North Carolina, Tennessee, Maryland, New Jersey, Pennsylvania, New York, Connecticut, New Hampshire, and Maine. Canada: Nova Scotia, Quebec, and Manitoba.

*Food plants.*—Seem to be "general feeders on plantain, dandelion, and such early starting plants" (teste Bird).

#### GENUS No. 9

#### "PROTORTHODES" TEXANA (Sm.)

Head 2.2 to 2.4 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, broadened on abdominal segments 7 and 8; skin smooth; general color light gray.

Dorsum and supraspiracular area of one shade except as noted. A segmental series of rather well defined, diamond-shaped, dark middorsal figures except reduced to a triangle on abdominal segment 8. A large pale area laterally on the

dorsum of 8. Subdorsal pale line, ventrad of setigerous tubercle II, bordered dorsally by a broken dark line and ventrally by a segmental series of small black spots reduced to a continuous oblique line on 7 and 8. Spiracles black. No subventral pale stripe. Venter pale flecked with whitish. Setigerous tubercles minute. Hind coxae widely separated. Head with a brownish area posterior to the ocelli, otherwise blackish with black freckles faintly visible.

Described from eight larvae collected near Superior, Ariz., late in March 1938. A moth emerged September 17, 1938, at Puyallup, Wash., and was determined by Clarke.

*Distribution.*—Texas, Arizona, California, and Utah.

*Food plants.*—Filaree (*Erodium cicutarium*) and *Haplopappus heterophyllus*.

### HOMORTHODES McD.

1. Spinneret slender, semitransparent and usually appressed to the labium and hypopharynx, easily overlooked. Skin bearing very minute rounded granules. With obscure pinkish spots about setigerous tubercles I and II. General color blackish..... 2
- Spinneret projecting normally. Skin smooth. Without pinkish spots about setigerous tubercles I and II. General color obscure brownish or gray. Spiracles entirely black..... 3
2. Head infuscated brown without markings except posterior to the ocelli. Spiracles orange. Setae of body infuscated brown..... *furfurata*  
Head brown with dark freckles visible through the overlying infuscation. Spiracles brown. Setae of body white..... *lindseyi*
3. Dorsum of abdominal segment 8 with a large yellow or orange area and with a dark transverse arc on posterior margin. Head a decided brown with black freckles..... *communis*  
Dorsum of abdominal segment 8 without yellow or orange areas and without a dark transverse arc on posterior margin. Head pale brown with brownish fuscous freckles..... *perbrunnea*

### HOMORTHODES FURFURATA (Grt.)

Head 1.8 mm. broad. Body about 21 mm. long and 3.5 mm. broad at middle, abruptly broadened on abdominal segments 7 and 8; skin bearing close, very minute, rounded granules; general color blackish.

Blackish throughout except somewhat paler midventrally with broad, much broken, obscurely pinkish middorsal and subdorsal lines and small pinkish areas about setigerous tubercles I and II. Spiracles orange with black rims. No subventral pale stripe. Setigerous tubercles minute, their setae infuscated brown. Head a decided, slightly infuscated brown, entirely without markings.

Described from six larvae collected on Toppenish Creek near White Swan in eastern Washington in April and May. Moths emerged VI.1.33 and VII.7.33, and were determined by Benjamin.

*Distribution.*—Occurs very discontinuously across the United States and Canada. United States: Maine, New York, Massachusetts, New Jersey, Virginia, Mississippi, Kansas, New Mexico, Arizona, California, Colorado, Utah, and Washington. Canada: British Columbia, Manitoba, and Quebec.

*Food plants.*—Maple, Indian-plum (*Osmaronia*), and dead leaves.

### HOMORTHODES LINDSEYI (Benj.)

Head 1.8 mm. broad. Body about 22 mm. long and 4 mm. broad, abruptly broadened on abdominal segments 7 and 8; skin bearing close, minute, rounded granules; general color very dark, nearly black.

Body unicolorous to the prolegs, pale midventrally. The broken middorsal line, a line slightly ventrad of setigerous tubercle II and spots surrounding I and

II, obscure pinkish. Setae white, their tubercles minute. Spiracles brown. Head brownish, infuscated, with numerous dark freckles visible through the infuscation.

Described from 18 larvae collected near Clarksville, Tenn., February 3, 1927. Moths emerged in March and were determined by Dyar. Usually considered to be a variety of *furfurata* but the larva seems to be distinct.

*Distribution.*—Tennessee, New Jersey, and New York.

*Food plants.*—Reared on dead oak leaves.

#### HOMORTHODES COMMUNIS (Dyar)

Head 1.6 to 1.7 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, broadened on abdominal segments 7 and 8; skin smooth; general color dark brownish.

Obscure, broken middorsal and subdorsal pale lines margined by dark lines. A segmental series of obscure, dark, diamond-shaped dorsal figures margined postero-laterally by obscure, oblique pale marks. Dorsum of 8 with a transverse, curved dark line posteriorly and a large yellow or orange area laterally traversed medially by the middorsal line. Supraspiracular area uniform, slightly darker than the dorsum. Spiracles dark brown. No definite subventral pale stripe but body more orange or reddish in this area. Venter sordid gray flecked with yellow, whitish and orange. Setigerous tubercles minute. Head a decided brown closely freckled with black.

Described from many larvae collected in Washington in April and May. Moths emerged in June and July, and were determined by Benjamin.

*Distribution.*—United States: California, Oregon, and Washington. Canada: British Columbia.

*Food plants.*—Larvae are found beneath leaves in deciduous woods and have been beaten from alder.

#### HOMORTHODES PERBRUNNEA (Grt.)

Head 1.8 to 1.9 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, broadened on abdominal segments 7 and 8; skin smooth; general color dark gray, dorsum somewhat paler than supraspiracular area.

Middorsal and subdorsal pale lines obscure, margined by a dark shade. No segmental series of dark, rhomboidal dorsal figures. No transverse black line posteriorly, or lateral pale, yellow or orange spots on dorsum of 8. Spiracles black. No subventral pale stripe. Venter to base of prolegs of dilute dorsal coloration, sordid gray midventrally. Setigerous tubercles minute. Head pale brown with infuscated brownish freckles.

Described from 20 larvae collected in Washington and Oregon in April, May, and June. Moths emerged in May, June, and July, and were determined by Benjamin.

*Distribution.*—United States: California, Oregon, and Washington. Canada: British Columbia.

*Food plants.*—Occur on the ground under deciduous leaves and have been beaten in the spring from bunches of leaves lodged among the branches of hazel, vine maple, and alder.

## FARONTA Sm.

(PROTOLEUCANIA McD.)

FARONTA DIFFUSA (Wlk.)

(PROTOLEUCANIA ALBILINEA (Hbn.))

Head 3 to 3.2 mm. broad. Body about 25 mm. long and 3 mm. broad, tapering strongly posteriorly; skin smooth; general color varying from green, olivaceous green, yellow, or pink to brownish.

Dorsum to and including setigerous tubercle I uniformly dark including a broad middorsal paler line. Tubercle II at dorsal margin of a broad pale stripe. Dorsal part of supraspiracular area somewhat darkened, lower part, including III and the dorsal apices of the spiracles, black. Spiracles pale yellowish with black rims. A broad, well defined pale subventral stripe. Venter of general color becoming white medially. Setigerous tubercles minute. Head of the general coloration bearing dark submedian stripes and reticulation in well marked specimens but these may be absent.

Described from 15 live larvae collected June 19, 1925, feeding on timothy heads at Lexington, Ky., and 20 alcoholic specimens from Ames, Iowa, furnished through the kindness of Prof. C. J. Drake. Moths determined by H. G. Dyar.

*Distribution.*—Occurs in the west from Texas, New Mexico, Arizona, and California to British Columbia, Alberta, and Manitoba in Canada. Recorded in the eastern United States from Maryland, Kentucky, and Illinois, northward to Maine and Wisconsin.

*Food plants.*—Feeds on various grasses and cereal crops showing a preference for the heads and a particular fondness for timothy.

## DARGIDA Wlk.

DARGIDA PROCINCTA (Grt.)

Head 3.2 to 3.5 mm. broad. Body about 35 mm. long and 6 mm. broad at middle; skin smooth; general appearance showing great diversity, varying from a green larva, in which the pale stripes may be faint, to black specimens with the pale stripes distinct but subdued by overlying flecks of the darker shade except sometimes at the margins. There may be dark spots anteriorly on the segments in the darker areas and the pale stripes may be tinged with salmon or pink.

A pale middorsal line or narrow stripe. A broader pale stripe immediately ventrad of setigerous tubercle II. A narrower pale stripe immediately dorsad of III and a broad subventral pale stripe. Spiracles white with black rims. Setigerous tubercles minute. Head variable in color, with or without reticulation.

Larvae have been collected in Washington in April, July, August, October, and November. The winter is spent as a nearly or quite mature larva. While found in the lowlands, this larva is even more common in mountain meadows. Moths determined by Clarke.

*Distribution.*—United States: Colorado, Utah, Nevada, California, Oregon, Washington, and Montana. Canada: British Columbia and Alberta.

*Food plants.*—Various grasses, sedges and rushes, wheat, and lupine.

## PSEUDALETIA Franc.

## ALETIA Hbn.

## LEUCANIA Ochs.

1. Spiracles pale yellowish, sometimes varying to pale gray. Frontal punctures on or slightly above the level of the frontal setae..... 5  
Spiracles black, sometimes varying to dark gray..... 2
2. Setae III and IV of the abdomen near the center of definite, nearly circular, sclerotized, flat tubercles of moderate size. Frontal punctures nearly always below the line of the frontal setae. Subdorsal pale line on cervical shield strongly margined dorsally with intense black. Of general distribution..... *Pseudaletia unipuncta*  
Setae III and IV on the abdomen not set in definite, nearly circular sclerotized areas but, usually, in small, irregular black spots. Pale subdorsal line on cervical shield with diffuse dark margins of the general intensity..... 3
3. Frontal punctures well below the line of the frontal setae. Occurs in Alaska, throughout Canada, and southward to New Jersey, Pennsylvania, Colorado, Utah, and California..... *Aletia oxygala* subsp. *luteopallens*  
Frontal punctures on or very slightly below the line of the frontal setae..... 4
4. Occurs along the Atlantic and Gulf coasts from Virginia to Florida and Texas..... *Leucania juncicola*  
Occurs along the Pacific coast from British Columbia to California and eastward to Alberta, Montana, Wyoming, and Utah..... *Leucania farcta*
5. Two of the ventral setae near tarsal claw decidedly broadened, lanceolate. Occurs along the Atlantic and Gulf coasts from North Carolina to Florida and Texas and in New Mexico and Arizona..... *Leucania latiuscula*  
Ventral setae near tarsal claw all slender, but slightly broadened. Rather generally distributed east of the Rocky Mountains..... 5
6. A sharply defined, continuous, black stripe including setigerous tubercle II; dorsum otherwise pale except along margins of the middorsal pale line. Ventral half of supraspiracular area, including III and some of the spiracles, much darker than the dorsal half..... *Leucania phragmitidicola*  
Dark stripe including setigerous tubercle II subdued, made up of dark flecks, dorsum darker than remainder of body. Ventral half of the supraspiracular area but slightly darker than the dorsal half..... *Leucania pseudargyria*

## PSEUDALETIA UNIPUNCTA (Haw.)

Head 3.2 to 3.5 mm. broad. Body about 35 mm. long and 5 mm. broad at middle tapering posteriorly; skin smooth; general color varying from bright red through pinkish and pale gray to the more usual dark gray.

The usual coloration is as follows: Ground color yellowish or gray, more or less tinged with pink. Dorsum to setigerous tubercle I dark, a pale stripe, more or less overlaid by dark flecks, occupying the longitudinal space between I and II. Tubercle II included in a narrow black stripe. Ventral portion of supraspiracular area, including III and some of the spiracles heavily infuscated or black, upper portion pale with dark flecks and including 2 dark lines. Spiracles entirely black. Ventrad of the spiracles abruptly pale tinged with pinkish. Head pale gray slightly tinged with brown with black submedian stripes and reticulation, frontal punctures nearly always below the line of the frontal setae.

Described from many larvae from various sources. Moths determined by H. G. Dyar and others.

*Distribution.*—Occurs throughout the United States east of the Rocky Mountains. To the west of the Rocky Mountains this species is seldom common but is reported from New Mexico, Arizona, Utah, Oregon, Washington, and Montana; also from British Columbia and Alberta, Canada. Larvae have been seen from Arizona, Oregon, and Washington.

*Food plants.*—Feeds by preference on grasses and cereal crops but will attack a wide range of plants when pressed by hunger.

## ALETIA OXYGALA sub. sp. LUTEOPALLENS (Sm.)

Head 2.9 to 3 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color varying from light yellow to pale brownish.

Middorsal pale line well defined margined with blackish. A yellowish stripe between setigerous tubercles I and II. Tubercle II included in a dilute blackish stripe. Ventral portion of supraspiracular area, including III and some of the spiracles, dilute blackish, dorsal portion white, including a median yellow or brownish stripe margined by dark lines. Spiracles black or dark gray. Subventral pale stripe well defined, yellowish. Venter of dilute dorsal coloration. Head whitish with dilute black submedian stripes and reticulation; frontal punctures well below the line of the frontal setae.

Described from many larvae collected about Puyallup, Wash., April to October; 12 larvae collected at Newport, Oreg., in May of 1935 and 1936 by Joseph Wilcox, W. W. Baker, and S. E. Crumb, Jr.; and 7 alcoholic larvae collected at Orono, Maine, August 25, 1929, from sedge by J. H. Hawkins. A larva collected at Newport, Oreg., May 11, 1935, produced a moth June 17. Moths determined by Schaus and by Clarke.

*Distribution.*—Alaska, throughout Canada, and southward to New Jersey, Pennsylvania, Colorado, Utah, and California.

*Food plants.*—Various grasses and sedges.

## LEUCANIA JUNCICOLA Gr.

Head 2.9 to 3.2 mm. broad. Body about 33 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color throughout pinkish or brownish, made up of intermingled strands of pink, yellow, and brown, more dilute ventrally.

A broken yellowish middorsal line with dark margins. Setigerous tubercle I in a pale area including two inconspicuous dark lines. Tubercle II included in a parallel margined black stripe bordered ventrally by a yellow line. Ventral portion of supraspiracular area, including III and some of the spiracles somewhat darker than the dorsal portion which is of the ground color and includes 2 broken dark lines. Spiracles black or dark gray. Subventral pale stripe sometimes absent. Head pale yellowish gray with dark submedian stripes and full dark reticulation tending to form lines; frontal punctures on or very slightly below the line of the frontal setae.

Described from 8 larvae collected at Mississippi A. and M. College, March 29, 1924, by H. W. Allen; 3 mature alcoholic larvae collected at Arlington, Va., September–October 1949 by J. G. Franclemont; and 4 larvae collected at Quincy, Fla., May 9–19, 1928, by the writer. The Mississippi larvae produced moths late in April. Moths determined by H. G. Dyar and others.

*Distribution.*—Virginia, North Carolina, South Carolina, Florida, Mississippi, and Texas.

*Food plants.*—Various grasses.

## LEUCANIA FARCTA (Gr.)

Head 3.1 to 3.3 mm. broad. Body about 30 mm. long and 5.5 mm. broad, tapering somewhat posteriorly; skin smooth; general color gray or pale brownish.

Pale lines middorsally and between setigerous tubercles I and II, dorsum otherwise of the ground color. Including II is a black stripe tending to be intensified anterior to the tubercle. Lower portion of the supraspiracular area, including III and some of the spiracles, distinctly darker than the upper portion which is white with a flesh-colored stripe somewhat ventrad of the centre. Spiracles black. Subventral pale stripe pinkish or brownish, margined dorsally

and ventrally by pale lines. Venter of dilute dorsal coloration. Head pale or pale brownish with dark submedian stripes and reticulation; frontal punctures on the line of the frontal setae.

Described from larvae collected in April, May, June, and October in Washington. Larvae collected in April and May produced moths in June, determined by F. H. Benjamin and others.

*Distribution.*—United States: California, Nevada, Utah, Wyoming, Oregon, Washington, and Montana. Canada: British Columbia and Alberta.

*Food plants.*—Various grasses including orchard grass and wild rye (*Elymus* sp.).

#### LEUCANIA LATIUSCULA H. S.

Head 3.1 to 3.3 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color yellowish or brownish sometimes tinged with pink.

Middorsal pale line distinct, with dark margins. Dorsum including setigerous tubercle I with the ground color overlaid rather uniformly by darker strands and flecks, a pale line between I and II. Tubercle II in a distinct but not conspicuous dark stripe margined ventrally by a pale line. Ventral portion of the supraspiracular area, including III and some of the spiracles, occupied by a subdued dark stripe, dorsal portion paler, of the ground color. Spiracles pale yellowish with black rims. Subventral pale stripe distinct. Venter of dilute dorsal coloration. Head yellowish with dark submedian stripes and reticulation, frontal punctures below the line of the frontal setae.

Described from 5 live larvae collected March 11, 1919, at Victoria, Tex., by J. D. Mitchell; 3 alcoholic specimens taken January 17, 1924, at Corozal, P. R., by J. C. Lopez; and 1 alcoholic larva collected October 29, 1910, at Brownsville, Tex., by R. A. Vickery. From the larvae sent by J. D. Mitchell a moth emerged April 24, 1919. Determination by H. G. Dyar.

*Distribution.*—North Carolina, South Carolina, Florida, Louisiana, Texas, New Mexico, and Arizona.

*Food plants.*—According to Vickery (41), the food plants include sugar cane, sorghum, corn, barley, oats, and Johnson grass.

#### LEUCANIA PHRAGMATIDICOLA Gn.

Head 3.4 mm. broad. Body about 30 mm. long and 5.5 mm. broad at middle, slightly broadest on median abdominal segments; skin smooth; general color pale yellowish to a warm yellowish brown.

Middorsal pale line outlined continuously by blackish, dorsum otherwise pale, unicolorous. A sharply defined, conspicuous, continuous, black stripe including setigerous tubercle II. Ventral half of the supraspiracular area, including III and some of the spiracles, much darker than the dorsal half. Spiracles pale yellowish with black rims. Subventral pale stripe well defined. Venter pale, flecked with white and with strands of brown. Head pale grayish brown with strong black or brown submedian stripes and sparse reticulation forming lines posterior to the ocelli; frontal punctures on or slightly above the line of the frontal setae.

Described from numerous larvae collected from February to June about Clarksville, Tenn. From larvae collected in February, moths emerged in March and April. Moths determined by Dr. J. McDunnough and Dr. H. G. Dyar.

*Distribution.*—United States: Montana, Nebraska, Kansas, Iowa, Illinois, Indiana, Ohio, Pennsylvania, New York, New Hampshire,

Massachusetts, New Jersey, District of Columbia, North Carolina, Florida, Tennessee, and Texas. Also reported from California and Utah, but these determinations are not verified. Canada: Manitoba.

*Food plants.*—Various grasses including bluegrass and wild rye (*Elymus virginicus*).

#### LEUCANIA PSEUDARGYRIA Gn.

Head 3.3 to 3.5 mm. broad. Body about 30 mm. long and 5.5 mm. broad at middle, slightly broadest on median abdominal segments; skin smooth; general color pale brownish, yellowish brown, or pale gray, more or less tinged with pinkish.

Dorsum slightly more infuscated than remainder of body with a slender, broken, pale middorsal line noticeably margined with black only near juncture of segments. A distinct but not strong dark stripe including setigerous tubercle II, darker on each segment anterior to the tubercle and bordered dorsally and ventrally by pale lines. Ventral part of the supraspiracular area, including III and some of the spiracles, slightly darker than the dorsal portion. Spiracles pale yellowish varying to gray. Subventral pale stripe flecked with pinkish and white, and merging into the ventral coloration. Head pale gray to brown with black or brownish submedian stripes and close reticulation forming lines posterior to the ocelli; frontal punctures on or slightly above the line of the frontal setae.

Described from 11 larvae collected about Clarksville, Tenn., and Lexington, Ky., in February, March, July, and November. Larvae collected in March produced moths in April. July larvae produced moths in August. Moths determined by Dyar.

*Distribution.*—North Carolina, Tennessee, Kentucky, Illinois, Ohio, Pennsylvania, New Jersey, New York, Connecticut, Massachusetts, New Hampshire, and Maine; also Quebec, Canada.

*Food plants.*—Larvae have been taken feeding on redtop, timothy, wild rye (*Elymus virginicus*), wheat, and orchard grass.

#### NEPHELODES Gn.

##### NEPHELODES EMMEDONIA (Cram.)

Head 4.1 to 4.7 mm. broad. Body about 35 to 45 mm. long and 9 mm. broad at middle, broadening gradually posteriorly to abdominal segment 7; skin set closely with small, dark, isolated, round, nearly flat, shining granules; general color dark brown to blackish, distinctly paler ventrally, usually with a distinct bronzy sheen.

A broad, sharply defined but subdued middorsal pale stripe, similar broader stripe slightly ventrad of setigerous tubercle II, an ill-defined pale line slightly dorsad of III and a broad, waxy white subventral band. Spiracles black. Setigerous tubercles minute. Cervical shield and anal shield black, each with 3 pale stripes. Head dark brown to brownish gray, usually with faint darker reticulation.

Described from many larvae from various sources. Crumb (18) gives an account of the life history and all stages of development in this species.

*Distribution.*—Generally distributed east of the Rocky Mountains from North Carolina, Tennessee, Missouri, Kansas, and Colorado, northward to Manitoba, Ontario, New Brunswick, and Newfoundland, Canada. West of the Rocky Mountains records include Oregon, Washington, and Montana in the United States, and British Columbia

and Alberta in Canada, where the species seems to be represented by varieties *pectinatus* Sm. and *tertialis* Sm. This species seems to be rare in Washington.

*Food plants.*—Prefers grasses and cereal crops, but has been reported as feeding on weeds and the buds and leaves of fruit trees.

## GENUS No. 10

### "POLIA" DELECTA B. & MCD.

Head 2.2 to 2.4 mm. broad. Body about 27 mm. long and 4 mm. broad, abdominal segments of approximately equal width throughout; skin smooth; general color an obscure gray.

Body entirely without markings. Skin transparent, faintly tinged with pinkish, sometimes appearing dull greenish from the food, rather closely, uniformly flecked with whitish to the spiracles. Spiracles dark brown. No subventral pale stripe. Venter of dilute dorsal coloration. Setigerous tubercles minute throughout. Cervical shield whitish narrowly margined with black. Head pale brown closely freckled with black, no dark submedian arcs or reticulation.

Described from eight larvae collected a few miles west of Ellensburg, Wash., September 25, 1930, on the ground about virgins-bower. A moth emerged May 30, 1931, and was determined by Benjamin.

*Distribution.*—California and Washington.

*Food plant.*—Virgins-bower (*Clematis* sp.)

## MISELIA Ochs.

### MISELIA VARIOLATA (Sm.)

Head 2.3 to 2.5 mm. broad. Body about 28 mm. long and 4 mm. broad at middle, tapering posteriorly; skin smooth; general color brownish yellow with dark markings.

A pale middorsal line evident only on thorax and near juncture of abdominal segments where it is strongly outlined in black. A segmental series of diamond-shaped black middorsal figures may be present on the abdomen. Faint traces of a pale subdorsal line. Supraspiracular area much flecked with black which is concentrated in a diffuse, oblique line arising dorso-anterior to the spiracle and including setigerous tubercle III. Spiracles blackish brown. Subventral stripe pale obscurely tinged with yellow and not distinctly differentiated from the ventral coloration. Venter slightly darker and very closely reticulate with white. Setigerous tubercles I, II, and III minute, others rather large, flat or nearly so. Head pale with dilute black submedian arcs, margining the front and including setae P<sup>1</sup> and P<sup>2</sup>, and dark reticulation posteriorly.

Described from numerous larvae collected near Rochester, Wash., August 27, 1930, by Wm. W. Baker. A moth emerged August 7, 1931, and was determined by Benjamin.

*Distribution.*—Utah, Washington, and Arizona.

*Food plant.*—Feed on seed capsules of *Lychnis* sp. (Baker).

## HADENA Schrank

### HADENA ECTYPA (Morr.)

Head 2.6 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering posteriorly; skin smooth; general color pale gray.

Middorsal pale line scarcely indicated except near juncture of segments, with strong dark margins. Dark reticulation on dorsum tending to form a segmental series of V-shaped figures with the apex at posterior margin of segments mid-dorsally. Supraspiracular area with obscure dark reticulation. Spiracles brown.

Venter pale. Setigerous tubercles minute dorsally but moderately large ventrally on abdominal segments 1 and 2. Cervical shield dilute blackish with 3 pale lines. Head pale brown with narrow, dark submedian stripes margining the front and near to, and nearly parallel with, the median line, and with dark reticulation laterally.

Described from three alcoholic larvae collected August 11, 1933, at Edgebrook, Ill., by A. K. Wyatt.

*Distribution*.—Illinois, West Virginia, Delaware, New Jersey, Pennsylvania, and New York.

*Food plant*.—Starry campion (*Silene stellata*) (Wyatt).

### CERAMICA Gn.

#### CERAMICA PICTA (Harr.)

Head 3.2 to 3.4 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; with prominent black and yellow longitudinal stripes.

The width of the various stripes varies decidedly among individuals and in different instars and the locations of stripes indicated below are but approximations. Middorsal pale line may be well developed or absent. Dorsum to setigerous tubercle II otherwise black with sparse transverse white markings. Ventrad of II a yellow stripe margined ventrally by a black stripe bearing about six transverse, slender white lines per segment and including the spiracles. Spiracles pale yellowish brown. Subventral stripe yellow extending to approximately midway between the spiracle and setigerous tubercle V and bordered ventrally by a black stripe reticulate with white and extending to base of prolegs. Venter unmarked, reddish brown. Ventral setigerous tubercles large. Head reddish, unmarked.

Described from numerous live, alcoholic, and inflated specimens collected in June and September. The writer has never reared this species, but moths are said to be on the wing in spring and again in the fall.

*Distribution*.—Occurs generally across the United States north of the southern boundaries of New Jersey, Pennsylvania, Ohio, Illinois, Kansas, Colorado, Utah, Nevada, and California, and in Newfoundland, Ontario, and Alberta, Canada.

*Food plants*.—A general feeder on herbs attacking a wide variety of garden and field crops.

### STRETCHIA Hy. Edw.

With a transverse pale area immediately posterior to setigerous tubercles II on abdominal segment 8. Subventral pale stripe (including most of the spiracles) not conspicuous but with margins distinct throughout.----- *plusiaeformis*  
Without a transverse pale area posterior to setigerous tubercles II on 8. Subventral stripe either not differentiated or, if visible, with ventral margin obscure.----- *muricina*

### STRETCHIA PLUSIAEFORMIS Hy. Edw.

Head 2.3 to 2.4 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of equal width except that 7 and 8 are slightly broadened, 9 and anal shield strongly declivous; skin smooth; general dorsal color to the spiracles made up of approximately uniform reticulation, the reticulation probably dark tinged with purple although of a reddish purple in the inflated specimens.

Dorsum to ventrad of setigerous tubercle II slightly paler than the supra-spiracular area. Middorsal pale line and the pale line ventrad of II may be

distinct or barely traceable. A transverse pale area immediately posterior to setigerous tubercles II on abdominal segment 8 may be distinct or barely indicated. Spiracles white with black rims, the abdominal spiracles entirely within the subventral stripe except on 7 and 8. Subventral stripe white, suffused with reddish except at margins. Area from subventral stripe to base of prolegs of dilute dorsal coloration. Venter pale. Setigerous tubercles minute. Cervical shield pale brown, shining, often with a dark margin. Head polished, a decided brown, apparently unmarked.

Described from five inflated larvae from the U. S. National Museum labeled "No. 933, Dyar and Caudell."

*Distribution*.—United States: California, Nevada, Utah, Colorado, Oregon, and Montana. Canada: British Columbia.

*Food plant*.—Currant (*Ribes*).

#### STRETCHIA MURICINA (Grt.)

Head 2.3 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of equal width except 7 and 8 slightly broadened, 9 and anal shield strongly declivous; skin smooth; general dorsal color an obscure purplish.

The slender, white middorsal line and that ventrad of setigerous tubercle II may be distinct or quite obscure. A slight intensification of the dark coloration posterior to II on 8. Spiracles white with black rims, the abdominal spiracles except on 7 and 8 included in the subventral stripe when this is differentiated. Subventral stripe pale, usually not indicated and with ventral margin obscure when present. Venter pale tinged slightly with purple. Setigerous tubercles minute, usually set in small, dark purplish spots. Cervical shield pale brown usually bordered by a dark line. Head smooth, a strong clear brown, entirely unmarked.

Described from 20 larvae collected in eastern Washington and Oregon in May and June. From material kept out of doors, moths emerged late in February of the following year and were determined by Clarke.

*Distribution*.—United States: California, Colorado, Oregon, and Washington. Canada: British Columbia and Alberta.

*Food plant*.—Currant (*Ribes*).

#### MORRISONIA Grt.

##### MORRISONIA CONFUSA (Hbn.)

This description probably is based on immature specimens. Head 2.9 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, tapering distinctly posteriorly; skin smooth; general color pinkish or whitish with a conspicuous dark reddish spot surrounding setigerous tubercle III.

An inconspicuous middorsal and more evident subdorsal white line. Dorsum pinkish with pale flecks, rather uniform to ventrad of III. Spiracles white, the rim brown, in the subventral stripe except on abdominal segment 8. Subventral pale stripe margined by white lines. Venter of dilute dorsal coloration. Setigerous tubercles minute except that III is moderately large. Tarsi black. Head brown, apparently unmarked.

Described from three larvae: One alcoholic larva, "On oak, Fairfax, Va., 12 June, 1934. A. Busck, coll.;" one inflated larva, "Dept. Agr.," and one alcoholic larva collected by W. W. Dowdy near Jefferson City, Mo., June 13. The first two larvae are from the U. S. National Museum.

*Distribution*.—Texas, Florida, Georgia, North Carolina, Virginia, Missouri, Pennsylvania, New Jersey, Connecticut, Massachusetts, and New York.

*Food plants*.—A leaf folder on oak, willow, hickory, apple, and other trees.

## MAMESTRA Ochs.

## POLIA Ochs.

## CROCIGRAPHA Grt.

1. Oral face of mandible with a basal process bearing an apical molar area (pl. 5, B)----- 8  
 Oral face of mandible with one or more basal teeth or with a thin, shell-like projection like a process with only the outer wall remaining (pl. 5, D). Neither the teeth nor the shell-like structure bearing a molar area----- 2
2. Length of spinneret equal to nearly twice length of labial palpus or more. Height of prothoracic spiracle much less than that of spiracle on abdominal segment 8 (27:35). Setigerous tubercles A<sup>1</sup>, A<sup>2</sup>, and A<sup>3</sup> forming a very obtuse angle at A<sup>2</sup>. Spiracles brown. Rather unicolorous species----- 3  
 Labial palpus at least nearly as long as spinneret (22:26). Setigerous tubercles A<sup>1</sup>, A<sup>2</sup>, and A<sup>3</sup> forming, at most, a slightly obtuse angle at A<sup>2</sup>. Spiracles white. Boldly striped species----- 4
3. Spiracles dark brown. Head 3 to 3.2 mm. broad at maturity. Feeds on sagebrush----- *Polia nugatis*  
 Spiracles light brown. Head 3.6 to 3.8 mm. broad at maturity. Does not feed on sagebrush----- *Polia purpurissata*
4. Head with black markings. Middorsal pale line or stripe distinct. Setigerous tubercle II at or slightly above dorsal margin of subdorsal pale stripe. Postero-median tubercles on anal shield, at most, but slightly nearer to each other than to the postero-lateral tubercles (25:28)----- 5  
 Head without black markings. Middorsal pale line very obscure or absent. Postero-median tubercles on anal shield usually decidedly nearer to each other than to the postero-lateral tubercles----- 6
5. With a distinct yellow middorsal line, distinctly broadened on the prothorax----- *Polia lilacina*  
 With a narrow yellow middorsal stripe, not broadened on the prothorax----- *Polia liquida*
6. Setigerous tubercle II at dorsal margin of the subdorsal yellow stripe. Middorsal pale line strong on the cervical shield. Setigerous tubercle III in a black stripe. Subventer purplish or pink to base of prolegs----- *Polia legitima*  
 Setigerous tubercle II near the centre of the yellow subdorsal stripe. Middorsal pale line faint or absent on the cervical shield----- 7
7. Dorsum to setigerous tubercle I green. Head green. Setigerous tubercle III in a green stripe. Subventer green to base of prolegs----- *Polia puberulenta*  
 Dorsum to setigerous tubercle I black. Head brown or purplish brown. Setigerous tubercle III in a purplish stripe. Subventer purplish to base of prolegs----- *Polia assimilis*
8. Spiracles brown or orange----- 9  
 Spiracles white or yellow----- 12
9. Labial palpus much longer than spinneret (50:30). Length of spinneret equal to but little more than twice the median width (30:12) or less. Dorsum with rather uniform dark reticulation to the spiracles----- *Polia grandis*  
 Labial palpus very slightly if at all longer than the spinneret. Length of spinneret equal to approximately three times the median width or more----- 10
10. Head and body green without dark markings. Rim of spiracle brown. Labial palpus and spinneret of approximately equal length (33:35). Height of prothoracic spiracle considerably greater than that of spiracle on abdominal segment 1 (24:20)----- *Polia distincta*  
 Coloration not as above----- 11
11. Spiracle orange. Heights of spiracle on prothorax and first abdominal segment approximately equal (31:30). A segmental series of connected black diamond-shaped spots middorsally. An oblique black line arising at setigerous tubercle III and directed dorso-posteriorly on abdominal segments----- *Polia nimbose*  
 Spiracles brown. Height of prothoracic spiracle decidedly greater than that of spiracle on abdominal segment 1 (33:26). Dorsum with rather uniform dark reticulation to but not including the spiracles----- *Polia later*

12. Postero-median tubercles on anal shield nearer to postero-lateral tubercles than to each other (13:23)----- 13  
 Postero-median tubercles on anal shield farther from each other than from the postero-lateral tubercles----- 14
13. General color pale gray. Subventral pale stripe without reticulation. *Polia cristifera*  
 General color pale brown. Subventral pale stripe overlaid with purplish reticulation----- *Polia invalida*
14. With a strong dorsal hump on abdominal segment 8----- *Polia adjuncta*  
 Without a dorsal hump on abdominal segment 8----- 15
15. With a series of small, dark middorsal spots at juncture of segments----- 16  
 Without a series of middorsal dark spots at juncture of segments----- 17
16. Spiracles white. Setigerous tubercle II<sup>b</sup> on mesothorax with a dark sclerotized bar contrasting in color with adjacent parts and connecting the tubercle with the ventral muscle attachment----- *Polia subjuncta*  
 Spiracles yellow. Setigerous tubercle II<sup>b</sup> on mesothorax without a visible sclerotized bar connecting the tubercle with the ventral muscle attachment----- *Polia lutra*
17. Setigerous tubercles I and II usually moderately large but flat, with a broad yellow subventral stripe, not entirely including any of the spiracles. *Polia atlantica*  
 Setigerous tubercles minute throughout, mere setal insertions----- 18
18. With a distinct white subventral stripe. All spiracles entirely in the dark dorsal coloration. Distribution limited to western areas. *Mamestra configurata*  
 Subventral pale stripe indicated but filled with dorsal color, the dorsal margin indicated by a pale line dorsal of all of the spiracles. Distribution limited to areas east of the Rocky Mountains----- *Crocigrapha normani*

## POLIA NUGATIS (Sm.)

Head 3 to 3.2 mm. broad. Body about 40 mm. long and 5 mm. broad at middle, abdominal segments of nearly equal width throughout; skin smooth; general color medium gray without definite markings.

Coloration uniform to and including the spiracles except as noted. Middorsal pale line slender, inconspicuous, the dark margining lines intensified at juncture of segments. Subdorsal pale line obscure, with diffuse marginal infuscation. Spiracles deep brown to blackish. No subventral pale stripe. Venter pale, unmarked. Setigerous tubercles minute. Head pale brown with darker brown submedian arcs and reticulation.

Described from 10 larvae collected in April in Washington. Moths emerged in late July and early September, and were determined by Benjamin and later by Clarke.

*Distribution.*—Distribution limited to areas west of the Rocky Mountains. United States: Texas, Colorado, Wyoming, Montana, Utah, Nevada, California, and Washington. Canada: British Columbia.

*Food plant.*—Feeds exclusively on sagebrush (*Artemisia*).

## POLIA PURPURISSATA (Grt.)

Head 3.6 to 3.8 mm. broad. Body about 45 mm. long and 7 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color an inconspicuous grayish brown without definite markings.

Middorsal pale line broken, very inconspicuous, margined by a faint dark shade which is intensified at juncture of segments. Subdorsal pale line absent. A segmental series of inconspicuous pale areas on abdominal segments posterior to setigerous tubercle II and extending slightly upon the following segment. Dorsum slightly paler than the supraspiracular area. No special dorsal markings on abdominal segment 8. Supraspiracular area uniform, with no intensification of the coloration in the line of the spiracles. Spiracles light brown. No subventral pale stripe. Venter sordid gray faintly flecked with whitish. Setigerous

tubercles minute. Head pale brown with dark submedian arcs and reticulation; spinneret narrow, tapering strongly to a point with the median dorsal area very narrow, giving, in general, much the appearance of the spinneret of a member of the Amphipyriinae (pl. 2, *M*).

Described from 10 larvae collected in Washington in June by Joseph Wilcox and the writer. Moths emerged in July and were determined by Heinrich.

*Distribution.*—Occurs discontinuously across the entire northern United States and in all of the adjacent Provinces of Canada. The United States records include: Pennsylvania, New York, Massachusetts, New Hampshire, Maine, Arizona, Utah, Colorado, Montana, and Washington.

*Food plants.*—Larvae have been collected from snowberry (*Symphoricarpos*) and swept from herbage at night. Phipps (36) lists blueberry (*Vaccinium*) and sweetfern (*Myrica*) as food plants.

#### POLIA LILACINA (Harv.)

Head 3.1 to 3.4 mm. broad. Body about 3.4 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; with prominent black, yellow and purplish longitudinal stripes.

A continuous yellow line middorsally, distinctly broadened on the thorax and margined by slender black lines. Dorsum to setigerous tubercle II otherwise black margined ventrally by a narrow yellow stripe with white margins. The yellow stripe margined ventrally by a stripe extending nearly to III, purplish or slate gray in dorsal half and more or less whitish ventrally. A dark stripe including III and partially including the spiracles and margined by black lines, the ventral line broader. Spiracles white. Subventral stripe yellow bordered ventrally by a black line in the line of V. Venter purplish to base of prolegs, whitish midventrally. Setigerous tubercles minute. Head whitish more or less tinged with yellow, with strong, slender, black submedian arcs and black to brownish reticulation.

Described from numerous larvae collected in Washington in August and September. Moths emerged in April and May, and were determined by Clarke.

*Distribution.*—Maine, New Hampshire, Connecticut, New York, New Jersey, Pennsylvania, Iowa, North Dakota, Arizona, Nevada, Utah, Colorado, Oregon, Washington, Montana and all of the adjacent Provinces of Canada.

*Food plants.*—*Aster*; one specimen on asparagus.

#### POLIA LIQUIDA (Grt.)

Head 3.3 to 3.6 mm. broad. Body about 3.5 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; with prominent black and yellow longitudinal stripes.

A middorsal stripe, yellow margined with white and not broadened on the prothorax. Dorsum to II otherwise black margined ventrally by a yellow stripe bordered ventrally by a black line. Supraspiracular area pale tinged with pinkish in dorsal portion, black in the ventral portion including III and partially including the spiracles. Spiracles white. Subventral stripe yellow margined with white, bordered ventrally by a black line in the line of V. Venter purplish to base of prolegs, whitish tinged with yellow midventrally. Setigerous tubercles minute. Head white with strong narrow black submedian arcs and black or brownish reticulation.

Described from numerous larvae collected in Washington in August, September, and October. Moths emerged in May, and were determined by Benjamin.

*Distribution.*—United States: Oregon, Washington, Idaho, and Montana. Canada: British Columbia and Alberta.

*Food plant.*—Grasses and aster.

#### POLIA LEGITIMA (Grt.)

Head 3 to 3.2 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; with prominent black and yellow longitudinal stripes.

Middorsal line obsolete except on prothorax. Dorsal area to setigerous tubercle II black margined ventrally by a yellow stripe. Supraspiracular area divided by a pale line, the dorsal portion slaty gray, the ventral portion including III and partially including the spiracles, black. Spiracles white. Subventral stripe yellow margined ventrally by a black line dorsal of V. Venter to base of prolegs lavender or pinkish. Setigerous tubercles minute. Head pale yellowish, the brown markings fused, covering most of head.

Described from numerous larvae collected in Tennessee in October and November. Moths emerged in August and September. Crumb (19) gives an account of this species with figures.

*Distribution.*—Generally distributed east of the Rocky Mountains north of the southern boundaries of North Carolina, Tennessee, Arkansas, and Oklahoma. Reported also from Utah, Oregon, and British Columbia, but these records need verification.

*Food plants.*—A rather general feeder as indicated by Crumb, the normal food probably being slender grasses such as *Muhlenbergia* and *Agrostis*.

#### POLIA PULVERULENTA (Sm.)

Head 3 to 3.2 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color composed of prominent green and yellow longitudinal stripes.

Middorsal pale line very faint or absent. A middorsal green stripe to but not including setigerous tubercle I. Tubercle I in a sharp black line. Tubercle II near the middle of a yellow stripe ventrad of which is a green stripe extending to but not including the spiracles and margined dorsally and ventrally by sharp black lines. Spiracles white, included in the subventral stripe. Subventral stripe yellowish green, the dorsal margin and a line at ventral margin white. Venter unmarked, bluish green suffused with white. Setigerous tubercles minute. Head brownish green, unmarked.

Described from 10 larvae collected in western Washington in August and September by Wm. W. Baker, Joseph Wilcox, S. E. Crumb, Jr., and the writer. Two moths emerged in May and were determined by Clarke.

*Distribution.*—United States: Colorado and Washington; also Alaska. Canada: British Columbia and Alberta.

*Food plants.*—Willow and aster.

#### POLIA ASSIMILIS (Mott.)

Head 3 to 3.2 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; with prominent black, yellow, and purplish longitudinal stripes.

Middorsally to but not always including setigerous tubercle I black or brownish black, sometimes with traces of a brownish middorsal line. Tubercle II well within a broad yellow stripe, narrowly white at the margins. Tubercle III in a purplish stripe margined dorsally and ventrally by sharp black lines. Spiracles white, included in the subventral stripe. Subventral stripe white dorsally, yellowish green ventrally margined by a white line. Venter purple to base of pro-

legs, yellowish white midventrally. Setigerous tubercles minute. Head purplish brown, without submedian arcs but with obscure, subdued, reddish reticulation.

Described from 15 larvae collected in western Washington in August and September. No moth has been reared, the determination being based on an inflated larva, "Stanhope, N. J., Sept. 23," received from Charles Rummel.

*Distribution.*—United States: Pennsylvania, New Jersey, Connecticut, New York, New Hampshire, Maine, Montana, and Washington. Canada: British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, and Quebec.

*Food plant.*—Willow.

#### POLIA GRANDIS (Bdv.)

Head 4 to 4.3 mm. broad. Body about 45 mm. long and 6.5 mm. broad at middle, abdominal segments of about equal width throughout; skin smooth; general color probably gray.

Middorsal and subdorsal pale lines and subventral pale stripe absent or barely indicated, the body uniformly reticulate with black to the spiracles excepting small black spots middorsally at juncture of segments and at setigerous tubercles I, II, and III. Spiracles brown. Venter to the prolegs of dilute dorsal coloration. Setigerous tubercles minute. Head pale brown with brown or infuscated brown submedian arcs and reticulation.

Described from eight mature alcoholic larvae collected August 3, 1941, at Chicago, Ill., by A. K. Wyatt.

*Distribution.*—United States: Maine, New Hampshire, Massachusetts, Connecticut, New York, Pennsylvania, New Jersey, Illinois, Wisconsin, Minnesota, Colorado, Utah, and Montana. Canada: British Columbia, Manitoba, and Quebec.

*Food plants.*—Fed on willow, linden, and blackberry; low plants refused (teste Wyatt).

#### POLIA DISTINCTA (Hbn.)

Probably immature. Head 3.3 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, tapering slightly posteriorly; skin smooth; general color green throughout.

White lines middorsally and slightly ventrad of setigerous tubercle II. Spiracles brown with brown rims. Subventral pale stripe margined dorsally and ventrally by white lines. Setigerous tubercles minute. Head pale grayish green, unmarked.

Described from four alcoholic larvae collected by A. K. Wyatt, at Chicago, Ill., June 1, 1938.

*Distribution.*—Colorado, Missouri, Iowa, Illinois, Ohio, Pennsylvania, New Jersey, New York, and Massachusetts.

*Food plants.*—Fed on linden, oak, and walnut but refused grape (teste Wyatt).

#### POLIA NIMBOSA (Gn.)

Head 3.6 to 3.9 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color a soft gray tinged with brown.

A middorsal white line. A connected segmental series of black, diamond-shaped middorsal spots. A segmental series of oblique black dashes with setigerous tubercle III in ventral margin. Spiracles orange. Subventral pale stripe indicated on thorax only. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head pale brown with black submedian arcs and reticulation.

Described from eight larvae collected in Washington in December (immature), March, and April by C. W. Getzender, Wm. W. Baker, and the writer. Two moths emerged in June and were determined by Clarke.

*Distribution*.—United States: California, Oregon, Washington, Colorado, Pennsylvania, New York, Vermont, and Maine. Canada: Quebec, Manitoba, Alberta, and British Columbia.

*Food plants*.—Huckleberry (*Vaccinium*) and vine maple (*Acer circinatum*).

#### POLIA LATEX (Gn.)

Head 4 to 4.4 mm. broad. Body about 40 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color brown.

Dorsal coloration to ventrad of setigerous tubercle III made up of a rather uniform infuscated brownish reticulation. Broken, inconspicuous white lines middorsally and slightly ventrad of II. No segmental series of dorsal figures. Dark markings anterior to II obscure and tending to appear only on anterior half of abdominal segments except on 8 where they are fairly distinct, wedge-shaped, and connected across the dorsum posteriorly by a black line. Spiracles brown, entirely within the subventral pale stripe on 4, 5, and 6. Subventral pale stripe apparently yellowish flecked with purple extending ventrally to V which is included in a faint purplish line. Venter flecked with purplish to base of prolegs, pale midventrally. Setigerous tubercles minute. Head brown with darker brown submedian arcs and reticulation, the reticulation obscured dorso-anteriorly by blackish suffusion.

Described from three larvae as follows: One inflated specimen, without data from Brooklyn Museum through the kindness of Geo. P. Engelhardt; 1 inflated larvae from U. S. National Museum: "On *Betula nigra*, Aug. 9, 1889"; and 1 alcoholic specimen from U. S. National Museum: "3056, D. C., August 13, 1893." Moths are said to emerge in May and June.

*Distribution*.—Restricted to the northeastern United States and adjacent Canada: Maryland, New Jersey, Pennsylvania, New York, Massachusetts, New Hampshire, Maine, and Quebec.

*Food plant*.—River birch (*Betula nigra*).

#### POLIA CRISTIFERA (Wlk.)

Head 3.3 to 3.6 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color pale gray.

Middorsal and subdorsal pale lines almost entirely absent. A segmental series of dark, shield-shaped, dorsal markings, the dark color intensified at lateral margins which do not include setigerous tubercle II. Otherwise the color to and partially including the spiracles is pale gray, paler posterior to the shield-shaped markings, except in an oblique, obscure, narrow, dark mark originating at setigerous tubercle III and extending dorsally posterior to II. Spiracles white. Subventral pale stripe margined dorsally and ventrally by dark lines. Venter darker than the lateral coloration flecked with white. Setigerous tubercles minute. Head white with brown submedian arcs and reticulation.

Described from seven larvae collected in Washington in August and September. Three moths emerged in May. One of these was determined by Benjamin, the others by Clarke.

*Distribution*.—United States: Oregon, Washington, Montana, Wyoming, Colorado, North Dakota, Pennsylvania, New York, Connecticut, Massachusetts, and New Hampshire. Canada: Ontario, Alberta, and British Columbia.

*Food plants.*—Specimens were taken while sweeping herbage and have fed on clover and other low plants in confinement.

#### POLIA INVALIDA (Sm.)

Head 3 to 3.1 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color brown.

Coloration to and partially including the spiracles made up of dark reticulation on a soft brown ground. Middorsal and subdorsal pale lines inconspicuous or absent. A segmental series of dark shield-shaped dorsal figures darker at lateral margins. An oblique dark line originating at setigerous tubercle III and extending dorsally to posterior margin of segment, the area between this and dark dorsal shields paler than remainder of side. Spiracles white. A distinct but subdued pale subventral stripe reticulate with purple. Venter white reticulate with purplish. Setigerous tubercles minute. Head pale with brown submedian arcs and reticulation.

Described from 10 larvae collected in Washington in September by Joseph Wilcox and the writer. Two moths emerged late in April, and were determined by Clarke. All of the larvae but one were taken at considerable elevation (Tipsoo Lake and White River Camp, Mount Rainier).

*Distribution.*—United States: California, Oregon, and Washington. Canada: British Columbia and Alberta.

*Food plants.*—Alder (*Alnus sinuata*) and *Eucephalus* sp.

#### POLIA ADJUNCTA (Bdv.)

Head 2.9 to 3.2 mm. broad. Body about 35 mm. long and 4.5 mm. broad at middle, abdominal segments of approximately equal width throughout, with a prominent, rounded dorsal hump on 8; skin smooth; general color soft olivaceous green with darker green or infuscated green markings.

A segmental series of broadly shield-shaped dorsal markings on abdomen, darker on 1, 2, and 8, tending to be darkest toward posterior margin which includes II, margined posteriorly by a pale line extending obliquely ventrad anterior to III and cut by the slender, pale middorsal line. A slender, broken dark line ventrad of II and another ventrad of III. Spiracles white, in a segmental series of oblique dark spots including IV margined dorsally by a pale line extending obliquely upon the proleg of the succeeding segment. Venter green. Setigerous tubercles minute. Head greenish with dark submedian arcs and sparse, inconspicuous reticulation.

Described from 20 larvae collected in Washington from early in August to early in October. Moths emerged in June and early July, and were determined by Clarke.

*Distribution.*—United States: North Carolina, Virginia, Maryland, Pennsylvania, New Jersey, New York, Massachusetts, Maine, Indiana, Illinois, Wisconsin, Nebraska, and Washington. Canada: British Columbia, Alberta, Manitoba, Ontario, and Nova Scotia.

*Food plants.*—Buttercup (*Ranunculus occidentalis*), wild currant (*Ribes*), salmonberry (*Rubus spectabilis*), elder (*Sambucus*), and willow.

#### POLIA SUBJUNCTA (G. & R.)

Head 3.5 to 3.7 mm. broad. Body about 36 mm. long and 6 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color brown or yellowish.

Coloration to the spiracles uniform brown or yellowish except as noted. Middorsal and subdorsal pale lines obscure or absent. A segmental series of oblique

marks arising subdorsally and extending obliquely dorso-posteriorly between setigerous tubercles I and II to meet middorsally, forming a small but distinct dark spot at juncture of segments except on 8 where the marks join across the dorsum. A dark line arising from this dark spot may extend to I. Supraspiracular area including the spiracles except on median abdominal segments and margined ventrally by a dark line. Spiracles white. Subventral pale stripe indicated but subdued. Venter of dilute dorsal coloration. Setigerous tubercles minute, X and I prominently encircled with black. Head pale with black submedian arcs and reticulation.

Described from 20 larvae collected in August and September in Washington by Wm. W. Baker and the writer. Moths emerged in June and were determined by Benjamin and by Clarke.

*Distribution.*—Rather generally distributed in the north in the United States and in the adjacent Provinces of Canada. The United States records include: New Mexico, California, Utah, Colorado, Nebraska, Oregon, Washington, Montana, Wisconsin, Illinois, Ohio, Maryland, Pennsylvania, Connecticut, Massachusetts, New Hampshire, New York, and Maine.

*Food plants.*—Willow, alder, maple, asparagus, strawberry, corn, and violet.

#### POLIA LUTRA (Gn.)

Head 3.5 to 4 mm. broad. Body about 37 mm. long and 6 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; occurs in two phases: the green phase described below and a yellow phase in which the markings are more prominent and purplish brown.

Body olivaceous green throughout flecked with white or yellowish. An inconspicuous pale middorsal line margined narrowly by dusky green and obliterated near juncture of abdominal segments by a small dark spot. A very inconspicuous pale line well ventrad of setigerous tubercle II bordered dorsally by a dusky line and obliterated at anterior margin of abdominal segments by a small but prominent, somewhat oblique blackish mark. Spiracles in the dorsal coloration, yellow. A yellowish subventral stripe distinct dorsally, fading out ventrally. Setigerous tubercles minute. Head pale or green with brownish or purplish submedian arcs and reticulation.

Described from numerous larvae collected in September and October in Washington by Wm. W. Baker and the writer. Moths emerged in May and June, and were determined by Clarke.

*Distribution.*—United States: Indiana, New Jersey, New York, Massachusetts, New Hampshire, Vermont, Maine, Washington, Idaho, and California. Canada: Quebec, Manitoba, and British Columbia.

*Food plants.*—Alder, vine maple (*Acer circinatum*), willow, spiraea (*Spiraea douglasi*), corn, and plantain (*Plantago*).

#### POLIA ATLANTICA (Grt.)

Head 3 to 3.1 mm. broad. Body about 36 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; "ground color, which varies remarkably in different specimens of the same brood, ranges from yellowish green, through a dull yellowish ochre, a ruddy brown to a dark amber brown." (Fletcher.)

A dark middorsal line formed by the margining lines of the broken, very inconspicuous middorsal pale line. A very irregular dark line similarly formed about the pale line immediately ventrad of setigerous tubercle II, distorted and nearly erased at II by an oblique pale area arising dorso-anterior to III and extending dorso-posteriorly with II in dorsal margin. A rather indefinite dark stripe including III and the spiracles, intensified on ventral margin. Spiracles white. Subventral stripe yellow, extending to but not including V. Venter of dilute dorsal coloration. Setigerous tubercles I and II usually moderately large but flat. Head brown with distinct brown submedian arcs and reticulation.

Described from seven reared alcoholic larvae, "Orono, Me., June 6, 1930," received through the kindness of J. H. Hawkins. Moths are said to be found during July and August.

*Distribution.*—Utah, Montana, Wisconsin, New York, Massachusetts, New Hampshire, Maine, and all of the adjacent Provinces of Canada.

*Food plants.*—Eggs found on European honeysuckle (*Lonicera caprifolium*) and larvae reared on this plant. Fed also in confinement on plantain and dandelion (Fletcher 25).

### MAMESTRA Ochs.

#### MAMESTRA CONFIGURATA Wlk.

Head 3 to 3.2 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of about equal width throughout to 8; skin smooth; general color varying from olivaceous green, olivaceous gray, and brownish to almost black, with or without conspicuous black dorsal markings.

Well marked specimens are described. Coloration to and including the spiracles nearly uniform except as noted. Middorsal and subdorsal pale lines broken, inconspicuous. A segmental series of black spots anterior to setigerous tubercle II, produced to include I and as a dorsally directed line at posterior margin. Supraspiracular area marked with brownish or orange at dorsal margin and usually with small black spots including the spiracles. Spiracles white. Subventral stripe yellow or orange, usually not well defined ventrally. Midventer pale or greenish. Setigerous tubercles minute. Head pale or pale brownish with or without brownish submedian arcs and reticulation.

Described from many larvae collected in Washington, Oregon, and Idaho from July to October. A moth emerged April 30, 1930, and was determined by Heinrich. This is known as the Bertha armyworm.

*Distribution.*—Mexico. United States: New Mexico, Arizona, Utah, Colorado, Oregon, Idaho, Washington, and Montana. Canada: British Columbia and Manitoba.

*Food plants.*—A very general feeder on herbs, the plants attacked including: alfalfa, potatoes, cabbage, pea, *Calendula*, gladiolus, and geranium. Also reported as feeding on fruit of apricot.

### CROCIGRAPHA Grt.

#### CROCIGRAPHA NORMANI (Grt.)

Head 3.4 mm. broad. Body about 35 mm. long and 5.5 mm. broad at middle, abdominal segments of about equal width throughout to 8; skin smooth; general color brown.

Body overlaid heavily and nearly uniformly with brown to well ventrad of the spiracles. Middorsal and subdorsal pale lines inconspicuous, with dark margins. A transverse dark line including setigerous tubercles II on 8. Spiracles white, in the subventral pale stripe. Subventral pale stripe obscure ventrally, filled with brownish. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head brown with two black spots on each side.

Described from one inflated larva labeled "Green Village, N. J., June 18" from Charles Rummel, and one immature alcoholic specimen (2.37 mm. head) labeled "Orono, Me., June 29, 1907, Lot 40" loaned from the U. S. National Museum.

*Distribution.*—Maryland, Pennsylvania, New Jersey, New York, Connecticut, Massachusetts, New Hampshire, and Maine.

*Food plants.*—Apple and cherry (teste Patch).

## XYLOMANIA Hamp.

Larvae of *Xylomania* change color drastically at the last or penultimate molt, and the data included in the following key and descriptions apply to mature larvae only.

1. With a basal tooth on oral face of mandible, not bearing a molar area. Midventral muscle attachments between and anterior to the prolegs forming a straight line on abdominal segments 3 and 4.----- *dolosa*  
Oral face of mandible with a basal process bearing an apical molar area. Midventral muscle attachments between and anterior to the prolegs forming a Y with the arms anterior, on abdominal segments 3 and 4.----- 2
2. Head reddish, without markings. Body without dark markings.----- 3  
Head pale or brown with black markings. Body with black markings.----- 4
3. General color of body whitish or very pale gray.----- *crucialis, simplica*  
General color of body red.----- *Xylomania* sp. (No. 26)
4. General color of body reddish. Black markings on body limited to a black line dorsad of the spiracles, more distinct between setigerous tubercle III and the spiracle.----- *Xylomania* sp. (No. 27)  
General color of body whitish or gray. Black markings of body more generally distributed.----- 5
5. Cervical shield white. Body white, with strong, sparse black markings  
*cognata*  
Cervical shield blackish brown. The whitish ground color of body overlaid rather generally on the dorsum with blackish strands and reticulation  
*hiemalis*

## XYLOMANIA DOLOSA (Grt.)

Head 3.7 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, abdominal segments of approximately uniform width to 8; skin smooth; general color gray.

Coloration to and including the spiracles rather uniform, composed of a black, splotchy reticulation on a white ground. Middorsal and subdorsal white lines obscure, the subdorsal branched to include setigerous tubercle II. An ill-defined black line in the line of the spiracles forming indefinite spots surrounding them. Spiracles black. Subventral stripe white somewhat marked with black. Venter to base of prolegs of dilute dorsal coloration, midventer pale. Setigerous tubercles small but more than mere setal insertions. Tarsi black. Head pale brown with black submedian arcs and reticulation.

Described from two alcoholic larvae reared from the egg at Ithaca, N. Y., by J. G. Franclemont, May-July 1940.

*Distribution.*—United States: Maine, New Hampshire, New York, Colorado, and Montana. Canada: British Columbia, Manitoba, and Ontario.

*Food plant.*—Aspen (*Populus tremuloides*) (teste Franclemont).

## XYLOMANIA CRUCIALIS (Hrv.)

Head 4 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering very slightly posteriorly; skin smooth; general color light gray without noticeable markings.

Dorsum to ventrad of setigerous tubercle III faintly gray, remainder of body sharply whitish throughout. Faint, broken middorsal and subdorsal pale lines. Spiracles black surrounded by small red spots, within the pale subventral stripe. Setigerous tubercles moderately large, flat, concolorous with the body. Cervical shield concolorous with adjacent parts. Head bright red, entirely unmarked.

Described from four larvae: two collected VIII.2.36 from alder near Enumclaw, Wash., by W. W. Baker, and two collected VII.8.43 from oak near Parkland, Wash., by the writer. From the alder larvae a moth emerged IV.16.37, which was determined by Clarke, while the oak larvae produced a moth III.29.44, which was determined by McDunnough.

*Distribution.*—United States: California, Utah, Washington, and Montana. Canada: British Columbia.

*Food plants.*—Alder and oak.

#### XYLOMANIA SIMPLEX (Wlk.)

Head 4 mm. broad. Body about 35 mm. long and 4 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color apparently pale gray to whitish.

Body pale flecked with white with broken, white middorsal and subdorsal lines. No dark markings. Spiracles black, in the pale subventral stripe. Setigerous tubercles large but not conspicuous. Cervical shield pale brown. Head reddish, unmarked.

Described from one alcoholic larva reared by J. G. Franclemont from eggs supplied from Washington. The moths are sometimes rather common about Puyallup, Wash., but the writer has never been able to rear larvae to maturity.

*Distribution.*—United States: New Mexico, Arizona, California, Utah, Colorado, Oregon, and Washington. Canada: British Columbia.

*Food plants.*—Unknown.

#### XYLOMANIA sp. (No. 26)

Head 3.7 to 3.9 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering slightly posteriorly; skin smooth; general color reddish.

Coloration made up of obscure pale flecks on a reddish ground, uniform to dorsad of the spiracles and somewhat paler ventrally. Middorsal and subdorsal pale lines obscure, the middorsal set in an obscure dusky shade. Spiracles black usually margined with orange or red and in the subventral pale stripe. Subventral pale stripe very obscure except sometimes at dorsal margin. Setigerous tubercles moderately large, flat, pale or brownish. Cervical shield whitish tinged with red or pale brownish. Head reddish-brown, unmarked.

Described from 12 larvae, usually taken 1 at a time in Washington from late in June to about the middle of July. No moth has been reared.

*Distribution.*—Washington.

*Food plants.*—*Ceanothus velutinus*, oak, raspberry, red huckleberry (*Vaccinium parvifolium*), willow, and loganberry.

#### XYLOMANIA sp. (No. 27)

Head 3.9 mm. broad. Body about 27 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color purplish red throughout.

Purplish red flecked with yellowish white throughout. Slender, nearly continuous middorsal and subdorsal pale lines, the middorsal with obscure dark margins. Obscure black markings about setigerous tubercle III. Spiracles black in the subventral pale stripe. Subventral pale stripe margined dorsally by a pale line, otherwise scarcely differentiated from the general subventral coloration. Setigerous tubercles large, brown. Cervical shield brownish. Head deep purplish brown with black submedian arcs and obscure, sparse dark reticulation.

Described from two larvae collected near Puyallup, Wash., in June and July. No moth was reared.

*Distribution.*—Washington.

*Food plant.*—Willow.

## XYLOMANIA COGNATA (Sm.)

Head 3.9 to 4 mm. broad. Body about 37 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout to 8; skin smooth; general color white with sparse, strong black markings.

White throughout except as noted. Middorsal line white margined faintly by dark lines forming a small dark spot at anterior margin of abdominal segments. There may be a segmental series of black markings outlining black shield-shaped dorsal figures or these may be incomplete or absent. A segmental series of black dashes anterior to II margined dorsally by a yellow or orange line. A dark line at the spiracles, broadly broken at the spiracles. Spiracles black, in the pale subventral stripe which is scarcely differentiated from the venter. Venter pale reticulate with white. Setigerous tubercles rather large, flat, pale brown. Cervical shield white. Head indefinite pale pinkish brown, with groups of unpigmented freckles and with a conspicuous black spot on each side on the occiput, sometimes black submedian arcs and reticulation are present.

Described from 16 larvae collected near Tieton, Wash., in May and June. From specimens kept out of doors, two moths emerged in February of the following year and were determined by Clarke.

*Distribution.*—United States: Colorado, California, and Washington. Canada: British Columbia and Alberta.

*Food plant.*—Oak (*Quercus garryana*).

## XYLOMANIA HIEMALIS (Grt.)

Head 3.4 to 3.5 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, abdominal segments of approximately uniform width throughout to 8; skin smooth; general color whitish with a segmental series of black subdorsal dashes.

Dorsum paler than the supraspiracular area which is tinged with lavender and margined ventrally by a black line. Coloration made up of a sparse blackish reticulation on a white ground. A strong, continuous middorsal pale line. Subdorsal pale line similar, giving off a short branch including setigerous tubercle II. A segmental series of strong black marks anterior to II, linear or becoming somewhat wedge-shaped posteriorly. An area laterad of I and surrounding II tinged with orange. Spiracles black, in the subventral pale stripe except on 8. Subventral pale stripe subdued, tinged with orange and extending to V. Venter greenish reticulate with white. Setigerous tubercles of moderate size, nearly flat, blackish. Cervical shield sharply defined, smoky infuscated brown. Head ground color pale lavender, a large area above base of antenna, front, adfrontal areas and the strong submedian arcs and reticulation, black.

Described from 20 larvae collected in eastern Washington from the latter part of May to the latter part of June. From specimens kept out of doors, two moths emerged in February of the following year and were determined by Clarke.

*Distribution.*—United States: California, Utah, Oregon, and Washington. Canada: British Columbia.

*Food plant.*—Antelope-brush (*Kunzia tridentata*).

## ORTHOSIA Ochs.

## ACERRA Grt.

## XYLOMYGES Gn.

1. Head without dark pigment, sometimes with green reticulation in *hibisc.*  
Subventral pale stripe absent or barely indicated..... 2
- Head with dark reticulation, faint in *Acerra*. Subventral pale stripe distinct  
except ventral margin obscure in *Orthosia praeses*. General color brown  
or gray..... 4

2. With a conspicuous transverse white or yellow line posteriorly on the dorsum of abdominal segment 8. Head setae in black spots----- 3  
Without a transverse, dorsal, pale line on abdominal segment 8. Subventral pale stripe indicated by a pale longitudinal line between setigerous tubercle III and the spiracle, representing the dorsal margin. Usually without black spots at setal insertions on head. General color green *Orthosia hibisci*
3. General color green. Spiracles white or pale yellow----- *Orthosia pacifica*  
General color brown. Spiracles infuscated gray----- *Orthosia ferrigera*
4. Without a dark, transverse dorsal bar or spot posteriorly on dorsum of abdominal segment 8. Head setae not set in black spots. Spiracles entirely and permanently black----- *Orthosia revicta*  
With a dark, transverse dorsal bar or spot posteriorly on abdominal segment 8, usually cut by the middorsal pale line. Head setae in black spots, faint in *Xylomyges curvialis*----- 5
5. With a segmental series of subdorsal black marks, linear on anterior abdominal segments and becoming triangular on 7 and 8. Ventral margin of subventral pale stripe obscure. Sieve plate of spiracle pale medially, blackish on the periphery; the dark coloration fading out in alcohol. Length of spinneret equal to more than twice the median width----- *Orthosia praeses*  
Without a segmental series of subdorsal black marks. Ventral margin of subventral pale stripe distinct----- 6
6. Spiracles entirely and permanently black. Length of spinneret usually equal to approximately twice the median width (21:11). Reticulation on head faint----- *Acerria normalis*  
Spiracles white or variegated as in *Orthosia praeses* with the dark peripheral color evanescent in alcohol. Length of spinneret not much greater than the median width (15:12). Head with full, distinct reticulation----- 7
7. Spiracles white. Venter green or purplish----- *Xylomyges curvialis*  
Spiracle with extreme centre pale, the periphery of sieve plate black. Venter whitish----- *Xylomyges rubrica*

## ORTHOZIA Ochs.

### ORTHOZIA HIBISCI (Gn.)

Head 3 to 3.1 mm. broad. Body about 33 mm. long and 4.5 mm. broad at middle, abdominal segments of approximately equal width throughout to 8; skin smooth; general color olivaceous green.

Olivaceous green throughout, except as indicated, much flecked with yellowish, the dorsum and midventer sometimes suffused with white. A strong white middorsal line. A slender white or yellowish line well ventrad of setigerous tubercle II. Spiracles white, well within the subventral pale stripe except on abdominal segment 8. Subventral pale stripe obsolete, represented by a slender yellowish or white line well above the spiracles except on 8. Setigerous tubercles minute, usually concolorous with body, sometimes black. Head green, marked with yellowish or white at the ocelli, unmarked otherwise or with faint darker green reticulation, the setal insertions occasionally black.

Described from many larvae collected in Washington from April to July. Moths emerged in February and March of the following year, and were determined by Benjamin and by McDunnough. Eggs deposited IV.1.41 hatched IV.17.41; the larvae were mature VI.4.41 and a moth emerged III.8.42. No differences have been found between larvae of eastern *hibisci* and western *hibisci* var. *quinquefasciata* Sm.

*Distribution.*—Occurs generally throughout the United States north of Maryland, Pennsylvania, Ohio, Illinois, Missouri, Kansas, New Mexico, Utah, and California; in all of the adjacent Provinces of Canada, and in Alaska.

*Food plants.*—A very general feeder, principally on woody plants.

## ORTHOZIA PACIFICA (Harv.)

Head 3.6 to 3.7 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of approximately equal width throughout to 8; skin smooth; general color pale green.

Body pale green throughout, closely flecked with white and with a whitish midventral suffusion, the minute setigerous tubercles in minute black spots throughout, including the head. With rather distinct middorsal and subdorsal white lines. A transverse, curved black mark including setigerous tubercles II on abdominal segment 8 margined posteriorly by a conspicuous white transverse stripe. Spiracles pale yellow, in the subventral pale stripe. Subventral pale stripe represented by a pale longitudinal line dorsad of the spiracles, otherwise obsolete. Head dark green excepting black setal insertions and yellowish spots at the ocelli.

Described from 15 larvae collected in Washington late in May and in June. From a larva collected May 29, 1929, a moth emerged March 20, 1930, and was determined by Clarke.

*Distribution.*—United States: Arizona, California, Utah, Colorado, Oregon, and Washington. Canada: British Columbia.

*Food plant.*—Oak.

## ORTHOZIA FERRICERA (Sml.)

Head 3 to 3.1 mm. broad. Body about 27 mm. long and 4 mm. broad at middle, abdominal segments of approximately equal width throughout to 8; skin smooth; general color light brown with a conspicuous transverse white line posterior to setigerous tubercles II on 8.

Body to the spiracles uniform light brown except as indicated. Middorsal line yellowish, very slender. Subdorsal pale line obscure. A segmental series of darker V-shaped dorsal figures on the abdomen, the arms passing obliquely dorso-posteriorly between setigerous tubercles I and II and growing more intense toward the middorsal line. A strong, transverse white line posterior to II on 8. Setigerous tubercle II in or beside a small yellowish white mark more conspicuous on anterior abdominal segments. Spiracles infuscated gray. Subventral pale stripe scarcely indicated. Venter of increasingly more dilute dorsal coloration. Setigerous tubercles minute. Head uniform gray tinged faintly with brown, the setal insertions inconspicuous black.

Described from 15 larvae collected in Washington in June. From a larva collected June 18, 1945, a moth emerged March 8, 1946, and was determined by McDunnough.

*Distribution.*—United States: Arizona, California, Oregon, and Washington. Canada: British Columbia.

*Food plant.*—Oak.

## ORTHOZIA REVICTA (Morr.)

Head 3 to 3.1 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, abdominal segments of approximately equal width throughout to 8; skin smooth; general color brown.

Dorsum to and including setigerous tubercle II yellowish brown, distinctly and sharply lighter than the suprspiracular area. Middorsal and subdorsal pale lines obscure, with diffuse dark margins. Spiracles black, well within the subventral stripe except on prothorax and abdominal segment 8. Subventral pale stripe strong, mottled with brownish, margined dorsally by an infuscated line. Venter of dilute dorsal coloration. Setigerous tubercles minute. Cervical shield blackish. Head brown with infuscated brown submedian arcs and reticulation.

Described from 10 larvae collected in Washington and Oregon in June and July. Moths emerged in March and April of the following year, and were determined by Clarke.

*Distribution.*—United States: Maine, New Hampshire, Massachusetts, Connecticut, New York, Pennsylvania, Washington, Oregon, Idaho, Utah, and Colorado. Canada: British Columbia, Alberta, Saskatchewan, Ontario, and Nova Scotia.

*Food plants.*—*Spiraea douglasi* and apple.

#### ORTHOSIA PRAESES (Grt.)

Head 2.8 to 3 mm. broad. Body about 32 mm. long and 4.5 mm. broad at middle, abdominal segments of approximately equal width throughout to 8; skin smooth; general color brown with black subdorsal markings.

Dorsal coloration uniform to and including setigerous tubercle III, except as indicated, composed of blackish reticulation on a pale ground tinged with purple. Middorsal and subdorsal pale lines obscure. A segmental series of linear black marks anterior to setigerous tubercle II, becoming wedge-shaped on abdominal segments 7 and 8. Spiracles pale medially, the margin more or less blackish, in dorsal margin of the subventral pale stripe on segments 1 to 6. Subventral pale stripe ill-defined ventrally, margined dorsally by an irregular, sinuous black line. Venter to base of prolegs of very dilute dorsal coloration; midventer pale tinged with purple. Setigerous tubercles minute. Head pale brown with dilute black submedian arcs and reticulation, the setal insertions black.

Described from 12 larvae reared from eggs in Washington. Eggs deposited March 26, 1941, hatched April 14, 1941; larvae were mature June 26, 1941, and a moth emerged March 1, 1942. Moth determined by McDunnough.

*Distribution.*—United States: California and Washington. Canada: British Columbia.

*Food plants.*—*Spiraea douglasi* and oceanspray (*Holodiscus discolor*).

#### ACERRA Grt.

##### ACERRA NORMALIS (Grt.)

Head 3 to 3.1 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, abdominal segments of approximately equal width throughout to 8; skin smooth; general color light gray to dark gray sometimes tinged with brownish or purplish.

Dorsum to and including setigerous tubercle III of uniform coloration except as indicated. Middorsal and subdorsal pale lines obscure, indicated by a dark margining shade. Dorsum of abdominal segment 8 bearing two black spots joined by a transverse black line. Spiracles black, well within the pale subventral stripe. Subventral pale stripe sharply defined but subdued, extending almost to V. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head brown, the setae in black dots, a black area margining the adfrontal areas to apex of front; reticulation sparse, faint, brownish or pink.

Described from 20 larvae collected in Washington and Oregon from late in May to the latter part of July. From material kept out of doors, moths emerged late in March of the following year, and were determined by Clarke.

*Distribution.*—United States: California, Nevada, Colorado, Oregon, Idaho, Washington, and Montana. Canada: British Columbia.

*Food plants.*—Oceanspray (*Holodiscus discolor*), antelope-brush (*Kunzia tridentata*), willow, mountain-mahogany (*Cercocarpus betuloides*).

#### XYLOMYGES Gn.

##### XYLOMYGES CURIALIS Grt.

Head 3.1 to 3.3 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general dorsal color obscure brownish gray, green, or purplish midventrally.

Coloration to setigerous tubercle III uniform except in a darker line or stripe at III, composed of dark reticulation on a brownish or purplish ground. Mid-dorsal and subdorsal pale lines obscure, margined by dark lines. A transverse bar posterior to setigerous tubercles II on abdominal segment 8. Spiracles white, in the subventral pale stripe on median abdominal segments. Subventral pale stripe white, sharply defined conspicuous, tinged somewhat with yellowish, pink, or brownish. Venter to base of prolegs of dilute dorsal coloration, tinged with purplish, mid-venter green flecked with white. Setigerous tubercles minute. Head pale with black submedian arcs and dark or brownish reticulation.

Described from 20 larvae collected in Washington and Oregon from late in May to early in July. From specimens collected in 1935 and kept out of doors, a moth emerged February 7, 1936, and was determined by Clarke.

*Distribution.*—United States: Arizona, California, Utah, Colorado, Oregon, Washington, and Montana. Canada: British Columbia.

*Food plants.*—Oak, antelope-brush (*Kunzia tridentata*), orange, lupine, and other herbs.

#### XYLOMYCES RUBRICA (Harv.)

Head 3.1 to 3.2 mm. broad. Body about 27 mm. long and 5.5 mm. broad at middle, tapering slightly posteriorly; skin smooth; general dorsal color dark brownish or yellowish brown.

The dorsum may be brownish and unicolorous with the supraspiracular area or may be yellowish and paler than the supraspiracular area. Supraspiracular area nearly unicolorous throughout, the ventral half slightly darker, the dark pigmentation intensified in a line at ventral margin. The slender, broken, pale mid-dorsal line obliterated by a dark spot at anterior margin of abdominal segments and expanded to form two distinct pale brownish or yellowish spots on each abdominal segment. Subdorsal pale line scarcely indicated. A black transverse bar posteriorly on dorsum of abdominal segment 8. Spiracles variegated, pale at centre, the margin dark, in the subventral pale stripe except at the extremities. Subventral pale stripe subnuded, closely flecked with white or yellowish. Venter pale flecked with white or yellowish. Setigerous tubercles minute. Head pale brown with black submedian arcs and reticulation, the arcs fading out anteriorly.

Described from many larvae collected in Washington from the latter part of June to the latter part of July. Moths emerged from February to April of the following year, and were determined by Benjamin.

*Distribution.*—United States: California, Utah, Colorado, Oregon, Idaho, Washington, and Montana. Canada: British Columbia, Alberta, and Manitoba.

*Food plants.*—Apple is the preferred food plant, but the larva feeds in nature to some extent on cherry, pear, alder, willow, and strawberry.

#### Subfamily UFEIINAE (Subfam. nov.)

##### UFEUS Grt.

1. Only the ventral ends of the spiracles in the subventral pale stripe. Third segment of labial palpus half as long as the basal segment or more. Setigerous tubercle III on abdominal segment 2 not more than the spiracle height removed therefrom.----- *sagittarius*  
Spiracles entirely within the subventral pale stripe. Third segment of labial palpus usually one-third as long as the basal segment or less.----- 2
2. Setigerous tubercle III on abdominal segment 2 not more than the spiracle height removed therefrom. Front black.----- *hulstii*  
Setigerous tubercle III on abdominal segment 2 much more than the spiracle height removed therefrom (32:20). Front pale.----- *faunus*

## UFEUS SACITTARIUS Grt.

Head 3.7 to 4.1 mm. broad. Body about 35 mm. long and 4.5 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color pale sordid blackish.

General coloration to and including the spiracles sordid blackish tinged with purple; purplish subventrally to base of prolegs and sordid pale ventrally. Middorsal line broken and inconspicuous or absent, not margined by a pale shade. A subdued pale line ventrad of setigerous tubercle II. Spiracles brown or infuscated brown, only their ventral ends in the subdued purplish subventral stripe. Setigerous tubercles minute. Cervical and anal shields brown. Head rough, a decided brown, submedian arcs, reticulation, an area above the antennal insertion, adfrontal areas and front, black.

Described from 25 larvae collected about Puyallup and Tieton, Wash., and Moscow, Idaho, from late in June to late in August by C. W. Getzendaner and the writer. Seven moths emerged between September 17 and October 20, and were determined by Clarke.

*Distribution.*—Washington, Idaho, and California.

*Food plant.*—Cottonwood (*Populus*).

## UFEUS HULSTI Sm.

Head 3.4 to 3.7 mm. broad. Body about 40 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color blackish.

Sordid blackish to and including setigerous tubercle III. A strong, continuous middorsal line white sometimes tinged with yellow and margined by an obscure pale shade. A broken pale line ventrad of II. The longitudinal area between II and III paler medially. Spiracles varying in color from yellowish brown to deep infuscated brown, entirely within the subventral pale stripe which is purplish with whitish marginal lines. Subventer and venter dull gray tinged with purplish. Setigerous tubercles minute. Cervical shield black. Anal shield blackish, darker medially. Head pale brown, submedian arcs, reticulation, an area above antennal insertion and front, black.

Described from many larvae collected from late in May to late in July both east and west of the Cascade Mountains, in Washington. Moths emerged from late in June to early in August, and were determined by Benjamin, Heinrich, and Franclemont. From two larvae collected July 20, 1937, at Puyallup, Wash., a moth was reared (No. 452 in U. S. National Museum) which was determined as *Ufeus unicolor* Grt. with the comment: "Probably equals *hulsti* Sm." The writer is unable to distinguish the one preserved larvae from that of *hulsti*.

*Distribution.*—Washington, Oregon, Idaho, Montana, California, Nevada, Utah, Colorado, New Mexico, and Arizona.

*Food plants.*—Poplar, aspen, and willow.

## UFEUS FAUNUS Stkr.

Head 2.7 to 2.9 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering distinctly posteriorly; skin smooth; general color light gray.

A sharp, narrow middorsal white line. Dorsum to setigerous tubercle I otherwise sordid pale. Setigerous tubercle II in a narrow dark stripe intensified anterior to II giving the appearance of a segmental series of black dashes. A sordid pale line ventrad of II bordered irregularly ventrally by a dark line. Tubercle III at centre of an irregular dark stripe. Spiracles dusky gray, within the pale subventral stripe which is bordered dorsally and ventrally by inconspicuous pale lines and faintly reticulate with purplish. Venter sordid pale, unmarked. Setigerous tubercle minute. Head pale, submedian arcs and reticulation usually obsolescent dorsally, area above antennal insertion and front pale.

Described from numerous larvae collected near Superior, Ariz., the latter part of March 1938 under bands on cottonwood and willow. Moths emerged early in May and were determined by Clarke.

*Distribution.*—New Mexico, Arizona, and California.

*Food plants.*—Cottonwood and willow.

### Subfamily AMPHIPYRINAE

This subfamily, as considered here, includes both the Amphipyrinae proper and a large section of the "Cuculliinae" not closely related to Cucullia and not quite separable from the Amphipyrinae, as larvae, in the present state of our knowledge. Groups 1, 2, and 3 of the following key are composed of genera from the cuculline segregate (except *Andropolia*), while groups 4 and 6 are mixtures; group 6, however, gives some evidence of being a natural unit. The remaining groups are drawn entirely from the Amphipyrinae proper.

#### A Grouping of the Genera in the AMPHIPYRINAE

1. Oral face of mandible with a basal or subbasal tooth or process (pl. 5, A-H), the tooth sometimes small. Setigerous tubercle II<sup>c</sup> distinctly ventrad of the margin of the cervical shield (pl. 7, L)----- 2
- Oral face of mandible without a basal or subbasal tooth or process except in a few species\* (pl. 5, 1-N)----- 5
2. Spinneret flattened and very distinctly grooved dorsally, the length equal to not more than four times the median width (pl. 3, B, C, F). Spiracles usually black, brown, or orange. Midventral muscle attachments on abdominal segment 3 forming a linear figure----- 3
- Spinneret often slightly flattened dorsally but subcylindrical or subconical with, at most, a narrow, impressed dorsal line except in *Eupsilia*.<sup>10</sup> Length of spinneret often equal to more than four times the median width. Spiracles often white or whitish----- 4
3. Height of prothoracic spiracle decidedly greater than that of the spiracle on abdominal segment 1 (25:20). Third segment of labial palpus, at most, but slightly more than one-half as long as the basal segment (10:17)
  - Group 1, p. 174
  - Height of prothoracic spiracle but slightly, if at all, greater than that of the spiracle on abdominal segment 1 (25:24). Third segment of labial palpus usually decidedly more than one-half as long as the basal segment.
    - Group 2, p. 181
4. Height of prothoracic spiracle decidedly greater than that of the spiracle on abdominal segment 1 (25:20). Length of spinneret equal to at least six times the median width and length of labial palpus not more than three-fourths that of the spinneret (32:49) except (both characters) in genus no. 12 ("*Graptolitha*" *dilatocula*). Spiracles white or whitish except black in *Lithophane animoda*----- Group 3, p. 184
- Either with height of prothoracic spiracle equal, at most, to but slightly more than that of the spiracle on abdominal segment 1 (30:29) or with labial palpus, at least, nearly as long as the spinneret. Length of spinneret often equal to less than six times the median width----- Group 4, p. 191
5. The normally projecting portion of the spinneret completely absent or reduced to a thin, scale-like structure appressed to the labium. Labial palpus very short, no longer than apical segment of maxillary palpus. Spiracles pale----- Group 5, p. 206
- Spinneret present, projecting normally----- 6

\* See discussion at end of key.

<sup>10</sup> In *Eupsilia* the spinneret is grooved dorsally, but length of spinneret is equal to 6 times the median width and the midventral muscle attachments on abdominal segment 3 form a Y-shaped figure (pl. 8, G).

6. Setigerous tubercle II<sup>c</sup> on cervical shield except in some genera of borers (pl. 7, Q). Setigerous tubercle II<sup>b</sup> on mesothorax without a sclerotized bar connecting the tubercle with the adjacent ventral muscle attachments (pl. 7, O). Midventral muscle attachments between prolegs forming a V-shaped figure with the arms approximately as long as the stem and usually marking the sides of a strongly impressed V-shaped area anterior to the prolegs (pl. 8, G)----- Group 8, p. 227
- Setigerous tubercle II<sup>c</sup> not on cervical shield but well ventrad of the margin (pl. 7, L). Setigerous tubercle II<sup>b</sup> on mesothorax usually with a sclerotized bar contrasting in color with adjacent parts and connecting the tubercle with the adjacent ventral muscle attachments (pl. 7, P). Midventral muscle attachments forming a linear figure except in *Laphygma* in which II<sup>b</sup> on the mesothorax has a conspicuous ventral bar. Includes no borers. 7
7. Labial palpus usually less than one-half as long as the spinneret and, at most, but three-fourths as long (18:24), with the third segment approximately one-half as long as the basal segment, or less. Length of spinneret equal to five times the median width or more, except in *Prozenus*. Setigerous tubercle IV dorso-posterior to the spiracle on abdominal segment 6. Spiracles black or dark brown.----- Group 6, p. 213
- Labial palpus and spinneret subequal in length (26:30) or with labial palpus longer. Length of spinneret equal to four times the median width or less (pl. 3, A, G)----- Group 7, p. 219

As indicated in couplet 1 of the above key, there is some variation with regard to the character of the mandible. *Platysenta*, *Amphipyra*, *Lycanades*, and *Aseptis* each include species in both categories of this couplet, while in *Achytonia* and *Eremobina* the basal mandibular tooth is small or obscure and is sometimes absent.

All of the above genera are included in both categories of couplet 1 except *Platysenta* and *Amphipyra*. *Platysenta* is distinguishable from anything else but *Ogdoconta* and *Leucoonycta* owing to the complete absence of the normally projecting portion of the spinneret and the presence of setigerous tubercle VII<sup>c</sup> on abdominal segment 1, while *Amphipyra pyramadoides* (with a subbasal tooth on mandible) is recognizable owing to the conspicuous, subconical dorsal hump on abdominal segment 8 and the extraordinary difference in the heights of the prothoracic and eighth abdominal spiracles (24:39).

In *Septis*, *Chytonia*, and *Archonara*, ribs 2 and 3 of the mandible are roundly elevated subbasally giving somewhat of the appearance of teeth (pl. 5, K), but setigerous tubercle II<sup>c</sup> is on the margin of the cervical shield and these genera fall into the second category of couplet 1.

### AMPHIPYRINAE, GROUP 1

Most of the genera in this group seem to be weakly defined and no larval characters of generic importance have been found for the separation of either *Metavaglaea* and *Sericaglaea* or *Epiglaea*, *Eucirrhocidia*, and *Chaetaglaea*.

1. Crochets on prolegs biordinal (pl. 6, H), this condition more evident on anal prolegs. Postero-median setigerous tubercles on anal shield approximately twice as far from each other as from the postero-lateral tubercles (18:10). Third segment of labial palpus approximately one-fifth as long as the basal segment (4:21)----- *Andropolia*
- Crochets on prolegs uniordinal (pl. 6, G). Postero-median setigerous tubercles on anal shield not farther from each other than from the postero-lateral tubercles. Third segment of labial palpus usually one-third as long as basal segment or more.----- 2

2. Mandible with one basal tooth or process, not joined to rib 3 (pl. 5, C)----- 3  
 Mandible with two basal teeth, one arising from rib 3 (pl. 5, A) or with a thin, transverse, shelflike, basal structure, sometimes reduced to a ridge and usually joined at one end to rib 3 forming a V-shaped figure (pl. 5, B)--- 4
3. Mandible with a very thin basal tooth without a molar area on ventral side. Head of mature larva 3.4 mm. broad and freckled with black----- *Lithomoia*  
 Basal tooth on mandible never very thin and usually with a distinct molar area on ventral side (pl. 5, C). Head of mature larva 4.6 to 5.3 mm. broad and not freckled with black----- *Xylota*
4. Transverse line of setae P<sup>2</sup> below apex of front. Length of spinneret equal to approximately twice the median width (24:11). Mandible with two basal teeth----- *Psectraglaca*  
 Transverse line of setae P<sup>1</sup> well above apex of front----- 5
5. Mandible with two basal teeth. Body broadening posteriorly. Adfrontal areas black or dark brown. Spiracles entirely within the pale subventral coloration on median abdominal segments----- *Sericoglaca*, *Melawaglaca*  
 Mandible with a transverse, shelflike basal structure usually joined to rib 3, forming a V-shaped figure. Abdominal segments of approximately equal width to 8. Adfrontal areas pale brown or whitish----- 6
6. Length of spinneret equal to twice the median width or less. Spiracles entirely within the pale subventral coloration on median abdominal segments. Distribution limited to areas west of the Rocky Mountains----- *Pseudoglaca*  
 Length of spinneret equal to approximately three times the median width. Not more than the ventral apices of the spiracles in the pale subventral coloration. Distribution limited to areas east of the Rocky Mountains except that *Eucirrhoedia* is found in Montana, Alberta, and British Columbia in the west----- *Eucirrhoedia*, *Epiglaca*, *Ghaetiglaca*

## ANDROPOLIA Grt.

## ANDROPOLIA DIVERSILINEATA (Grt.)

Head 2.9 to 3.1 mm. broad. Body about 35 mm. long and 5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color pale gray with prominent markings.

Dark coloration composed of a blackish reticulation on a whitish ground, the dorsum somewhat darker than the supraspiracular area. Middorsal white line slender, broken at the incisures through fusion of the dark bordering lines. Subdorsal whitish line somewhat broken, touching the white dot including II and margined dorsally by a dark line. A segmental series of broad black spots on the abdomen, arising subdorsally, curving between I and II and extending dorso-posteriorly without reaching the middorsal line. Supraspiracular area uniform soft gray with a very sinuous slender black stripe including the spiracles and broadened posterior to them. Spiracles pale yellow. A sharply defined subventral stripe of white reticulation margined by white lines. Venter sordid pale closely reticulate with white. Setigerous tubercles minute. Head pale with strong blackish submedian arcs and reticulation.

Described from numerous larvae collected in eastern Washington in June. Moths emerged late in July, and were determined by Clarke.

*Distribution.*—Texas, New Mexico, Arizona, California, Utah, Colorado, Washington, Montana, and Nebraska.

*Food plant.*—Antelope-Brush (*Kunzia tridentata*).

## LITHOMOIA Hbn.

## LITHOMOIA SOLIDAGINIS (Hbn.)

Head 3.4 mm. broad. Body about 33 mm. long and 5 mm. broad at middle, abdominal segments of about equal width to 8; skin smooth; general color dark gray.

Similar white lines middorsally, ventrad of setigerous tubercle II and dorsad of III. A segmental series of black spots on abdomen arising subdorsally and extending dorso-posteriorly between I and II without meeting middorsally.

Spiracles deep infuscated brown, in a black line enlarged to include them. A distinct dull white subventral stripe extending to but not including V, with obscure dark markings and tinged with purple. Venter dark becoming paler midventrally. Setigerous tubercles minute, in conspicuous dots, dull yellow about I and II, white elsewhere. Head pale brownish, a broad area beside the front black with obscure black freckles, remainder with pinkish or brownish reticulation.

Described from eight larvae collected in Washington on Highway 410 at Indian Flat on the eastern slope of the Cascade Mountains, May 27, 1939. Two moths emerged late in July 1939, and were determined by Clarke.

*Distribution.*—Washington, Pennsylvania, Massachusetts, New York, New Hampshire, Maine, all of the adjacent Provinces of Canada, and Alaska.

*Food plant.*—*Spiraea douglasii*.

#### XYLENA Ochs.

- |   |                      |
|---|----------------------|
| 1. Head with conspicuous, black submedian arcs which fade out on the occiput. |                      |
| Submedian arcs inconspicuous, brown or absent.....                            | 2                    |
| 2. Head unmarked or with faint pinkish or greenish reticulation.....          | <i>nupera</i>        |
| Head with distinct brown submedian arcs and reticulation.....                 | 3                    |
| 3. With a dark line just dorsad of the spiracles.....                         | <i>curcimumacula</i> |
| Without a dark line dorsad of the spiracles.....                              | <i>cineritia</i>     |

#### XYLENA BRUCEI (Sm.)

Head 4.9 to 5.3 mm. broad. Body about 40 mm. long and 6 mm. broad, abdominal segments of about equal width throughout to 8; skin smooth; general color soft brownish to orange brown.

Middorsal pale line strong, continuous, margined by inconspicuous dark lines. Pale line ventrad of setigerous tubercle II inconspicuous, a branch including the tubercle. A segmental series of dark lines anterior to II form the sides of more or less developed dark shield-shaped dorsal figures on the abdomen. Spiracles orange, partially included in the narrow, dull white subventral stripe except on abdominal segment 8. Venter pale, flecked with white and tinged with purple. Setigerous tubercles minute. Head pale brown with strong, broad, black submedian arcs fading out on the occiput and margined by a little dark reticulation.

Described from 20 larvae collected near Tieton, Wash., late in May and early in June. A moth emerged August 2, 1940, and was determined by Clarke. In the penultimate instar this larva is green.

*Distribution.*—United States: Arizona, Utah, Colorado, and Washington. Canada: British Columbia and Alberta.

*Food plant.*—Antelope-brush (*Kunzia tridentata*).

#### XYLENA NUPERA (Lint.)

Head 4.9 to 5.3 mm. broad. Body about 45 mm. long and 7.5 mm. broad, abdominal segments of about equal width to 8; skin smooth; occurs in both a green and a darker phase, the dark markings being less intense in the green phase.

Middorsal and subdorsal pale lines distinct or inconspicuous. Dorsum to ventrad of setigerous tubercle II darker than the sides. Below this to and partially including the spiracles, a broad band of pinkish brown or green gradually darker ventrally, particularly in the line of the spiracles. Spiracles orange or red. A narrow white or yellowish subventral stripe which may fade out ventrally. Venter pinkish or green. Setigerous tubercles minute, the dorsal in round pale spots. Head greenish or brown, unmarked, or with faint greenish or pink reticulation.

Described from 4 larvae collected in Washington in June and 6 alcoholic specimens collected at East Wareham, Mass., by Dr. H. J. Franklin. A moth emerged August 27, 1935, and was determined by Heinrich. Dr. Franklin (26) gives an account of this species with figures.

*Distribution.*—Colorado, Utah, California, Oregon, Washington, Minnesota, Illinois, Pennsylvania, New Jersey, Massachusetts, New York, New Hampshire, Vermont, Maine, and all of the adjacent Provinces of Canada.

*Food plants.*—Franklin lists cranberry, weeds, grasses, *Iris* and apple, and we have taken larvae on *Iris* and willow.

#### XYLENA CURVIMACULA (Morr.)

Head 4.9 to 5.3 mm. broad. Body about 45 mm. long and 7 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color brown.

Middorsal pale line distinct or obscure, margined by narrow dark lines. Pale line well ventrad of setigerous tubercle II, obscure, margined by dark lines. A segmental series of indefinite dark lines arising subdorsally, curving between I and II and extending dorso-posteriorly to the middorsal line, outline a series of shield-shaped dorsal figures on at least some posterior abdominal segments. A dark brownish line or stripe dorsad of the spiracles except on 8, bordered ventrally by a pale line representing the dorsal margin of the subventral pale stripe which is otherwise absent. Spiracles brownish. Venter pale tinged with pink. Setigerous tubercles minute. Head pale brown with darker brown submedian arcs and reticulation.

Described from 2 live larvae collected near Puyallup, Wash., in June; 3 alcoholic larva reared at Ithaca, N. Y., April–May 1947, by J. G. Franclemont; and 7 alcoholic larvae collected near Chicago, Ill., May 20, 1937, by A. K. Wyatt. Moths emerged September 6, 1932, and September 21, 1934, from the Puyallup specimens, and were determined by Benjamin.

*Distribution.*—Washington, Minnesota, Illinois, Pennsylvania, New York, Rhode Island, Connecticut, New Hampshire, Maine, and all of the adjacent Provinces of Canada, except we have no records for New Brunswick, Nova Scotia, and Saskatchewan.

*Food plants.*—Alder, poplar, chokecherry (*Prunus virginiana*), dandelion, and other herbage.

#### XYLENA CINERITIA (Grl.)

Head 4.7 to 5.3 mm. broad. Body about 42 mm. long and 6 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color pale yellowish brown to dark brown.

Coloration to and including the spiracles uniform except as indicated. Middorsal and subdorsal pale lines obscure, margined by dark lines. A segmental series of dark lines arising subdorsally, curving between I and II and extending dorso-posteriorly to the middorsal line, outline a series of shield-shaped dorsal figures on the abdomen. Spiracles light yellowish brown or pale orange. A strong pale line just ventrad of the spiracles representing the dorsal margin of the subventral pale stripe which is otherwise absent. Venter pale tinged with purplish. Setigerous tubercles minute. Head pale brown with darker brown submedian arcs and reticulation.

Described from numerous larvae collected in Washington east of the Cascade Mountains, in June and July. Moths emerged in September, and were determined by Heinrich.

*Distribution.*—Utah, Colorado, Oregon, Idaho, Washington, Pennsylvania, New Jersey, Connecticut, Rhode Island, New Hampshire, Maine, Alaska, and all of the adjacent Provinces of Canada, except that we have no records from Quebec, New Brunswick, and Nova Scotia.

*Food plants.*—Swept from herbage, particularly lupines.

### PSECTRAGLAEA Hamp.

#### PSECTRAGLAEA CARNOSA (Grt.)

Head 4 mm. broad. Body about 45 mm. long and 7.5 mm. broad at middle, abdominal segments of approximately equal width throughout; skin smooth; general color reddish brown.

Coloration of uniform tint throughout but somewhat more dilute ventrally, composed of close reddish reticulation, without markings. Middorsal and subdorsal pale lines inconspicuous or absent. Spiracles dark infuscated brown. Subventral pale stripe indicated by a faint pale line at dorsal apices of spiracles. Setigerous tubercles minute. Head smooth, brown with red submedian arcs and reticulation.

Described from one inflated larva collected at Lakehurst, N. J., June 18, by Charles Rummel.

*Distribution.*—New Jersey, Pennsylvania, Massachusetts, New York, and Maine.

*Food plants.*—Unknown.

### METAXAGLAEA Franc.

#### SERICAGLAEA Franc.

Middorsal pale line almost obsolete except on posterior half of abdominal segments. Cervical shield with a subdorsal pale line. Head with dark brown markings.----- *Sericagliaea signata*

Middorsal pale line narrow but continuous. Cervical shield broadly pale laterally. Head with black markings.----- *Metaxaglaea inulta*

#### SERICAGLAEA Franc.

#### SERICAGLAEA SIGNATA (French)

Head 3.3 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, broadening gradually posteriorly; skin smooth; general color probably gray.

Coloration to and partially including the spiracles composed of close, uniform dilute blackish reticulation, without dark markings. Middorsal pale line narrow, uniform, continuous. Subdorsal pale line well ventrad of setigerous tubercle II broken, inconspicuous. Spiracles brown, included in subventral pale stripe on median abdominal segments. A broad, pale subventral stripe including V. Venter apparently pale. Setigerous tubercles minute. Head smooth, brown with darker brown submedian arcs and reticulation.

Described from 5 alcoholic larvae: 4 labeled "Fremont, Ind., May 8, 1935, linden and cherry, A. K. Wyatt coll." and 1 labeled "Horseheads, N. Y., April-May 1939, *Prunus serotina*, J. G. Franclemont reared."

*Distribution.*—New York, Pennsylvania, Maryland, and Illinois.

*Food plants.*—Wild cherry (*Prunus*) and linden.

## METAXAGLAEA Franc.

## METAXAGLAEA INULTA (Grt.)

Head 3.3 mm. broad. Body about 42 mm. long and 6 mm. broad at middle, abdominal segments broadening gradually posteriorly; skin smooth; general color pale gray.

Body to but not including the spiracles rather uniformly reticulate with dilute blackish. Middorsal pale line almost obsolete except on posterior half of abdominal segments. Subdorsal pale line less evident. Spiracles dark infuscated brown, within the broad, pale subventral stripe except on abdominal segments 1 and 8. Setigerous tubercles minute. Head smooth, brown, with strong black submedian arcs and reticulation.

Described from two alcoholic larvae labeled "Ithaca, N. Y., May 1939, *Fiburnum lantana*, J. G. Franclemont reared."

*Distribution*.—Iowa, Illinois, Virginia, Maryland, New Jersey, Pennsylvania, Rhode Island, New York, Maine; also Quebec, Canada.

*Food plants*.—*Fiburnum* spp.

## PSEUDOGLAEA Grt.

## PSEUDOGLAEA OLIVATA (Harv.)

Head 4 to 4.3 mm. broad. Body about 45 mm. long and 6 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color varying through various shades of brown to light gray.

Coloration to but not including the spiracles of one shade without markings except as indicated. Middorsal pale line inconspicuous, margined by a dark shade forming small black spots at juncture of segments. Pale line well ventrad of setigerous tubercle II obscure, margined by a dark shade. Spiracles brownish, yellow or orange, included in the subventral pale stripe except on 8. Subventral pale stripe usually distinct dorsally, fading out ventrally. Venter much paler than the dorsum. Setigerous tubercles minute. Head pale or pale brown with brown or blackish submedian arcs and reticulation.

Described from many larvae collected in Washington from about the middle of April until the latter part of May. Moths emerged in August and early September, and were determined by Benjamin.

*Distribution*.—United States: Texas, New Mexico, Arizona, Colorado, Utah, California, and Washington. Canada: British Columbia.

*Food plants*.—A very general feeder on woody plants including: Poplar, oak, hazel, *Amelanchier*, alder, antelope-brush (*Kunzia*), snowberry (*Symphoricarpos*), and Oregon grape (*Berberis*).

## EPIGLAEA Grt.

## CHAETAGLAEA Franc.

## EUCIRRHOEDIA Grt.

1. Head markings black. Middorsal white line broadened to form a small but conspicuous spot posteriorly on each abdominal segment. Hind coxae nearly half the femur width apart (8:18)----- *Epiglaea decliva*  
Head markings brown. Middorsal white line not forming spots on abdominal segments. Hind coxae nearly or quite touching----- 2
2. Blade of the maxillulae bearing about five short, slender hairlike teeth. Lobes of the maxillulae forming a narrow elevated rim about the sunken gorge both laterally and posteriorly. Rim of spiracles narrower, the portion of the width of the sieve plates (within the rim) to entire width of spiracle on the order of 19:23----- *Eucirrhoedia pampina*

Blade of maxillulae bearing about 10 flat, strap-shaped or triangular teeth. Gorge as high as lobes and not margined by them posteriorly. Rim of spiracles broader, the proportion of sieve plate width to entire width of spiracle on the order of 16:27----- 3

3. Subventral white stripe fading out ventrally. Spiracles brown

Subventral white stripe of equal intensity for its entire width. Spiracles deep infuscated brown, approaching black----- *Chaetagnata sericea*  
*Epiglaea apiata*

### EPIGLAEA Grt.

#### EPIGLAEA APIATA (Grt.)

Head 3.7 mm. broad. Body about 36 mm. long and 5 mm. broad, abdominal segments of about equal width throughout to 8; skin smooth; general color reddish brown.

Dorsal coloration to and partially including the spiracles made up of a nearly uniform brown mottling suffused with reddish, on a pale ground, the color somewhat intensified in the middorsal line and in the ventral half of the supra-spiracular area. Spiracles dark brown. A conspicuous white subventral stripe. Venter of dilute dorsal coloration with the reddish more distinct. Setigerous tubercles minute. Head pale with brown submedian arcs and reticulation.

Described from eight alcoholic larvae collected at East Wareham, Mass., by Dr. H. J. Franklin who has given an account of this species with figures (26).

*Distribution.*—New Jersey, Pennsylvania, New York, Massachusetts, and Maine.

*Food plant.*—Cranberry.

#### EPIGLAEA DECLIVA (Grt.)

Head 3.5 mm. broad. Body about 35 mm. long and 6 mm. broad, tapering very slightly posteriorly; skin smooth; general color uniform brownish.

Coloration to and including the spiracles uniform brown except as noted. The slender, broken white middorsal line broadened to form a small but conspicuous spot posteriorly on each abdominal segment. Faint pale lines ventrad of setigerous tubercle II and dorsad of III. Spiracles dark, infuscated brown. Subventral pale stripe appearing as a pale line through the spiracles, fading out ventrally. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head yellow with black submedian arcs and reticulation.

Described from live larvae collected in Tennessee in May; 8 inflated larvae collected in New Jersey, June 15, by Charles Rummel, and 1 alcoholic larva reared at Ithaca, N. Y., April–May, by J. G. Franclemont. From larva taken on a cherry sprout at night at Knoxville, Tenn., May 10, 1919, a moth was obtained October 3, 1919, after the larva had lain inactive in the soil until August 21 when it pupated. Moths have been taken at Clarksville, Tenn., from October to early in December.

*Distribution.*—Wisconsin, Illinois, Tennessee, Virginia, Maryland, New Jersey, Pennsylvania, Connecticut, and New York.

*Food plants.*—Chokecherry (teste Franclemont) and *Prunus serotina*.

## EUCIRRHOEDIA Grt.

## EUCIRRHOEDIA PAMPINA (Gr.)

Head 3.2 mm. broad. Body about 38 mm. long and 5.3 mm. broad at middle, abdominal segments of approximately equal width throughout to 8; skin smooth; general color brownish.

A white middorsal line. Other markings not determinable in the specimens at hand. Spiracles brown. Setigerous tubercles minute. Head with brown submedian arcs and reticulation.

Described from two alcoholic larvae reared at Ithaca, N. Y., April-May 1939 by J. G. Franclemont.

*Distribution*.—Montana, Colorado, Iowa, Minnesota, Tennessee, North Carolina, Maryland, New Jersey, Pennsylvania, New York, Massachusetts, Maine, and all of the adjacent Provinces of Canada.

*Food plant*.—Maple (*Acer saccharum*) (teste Franclemont).

## CHAETAGLAEA Franc.

## CHAETAGLAEA SERICEA (Morr.)

Head 3.7 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, abdominal segments of about equal width throughout to 8; skin smooth; general color pale brown.

Coloration to and including the spiracles made up of a close, uniform, infuscated brown reticulation, tinged with pinkish and without definite dark markings. Slender, broken middorsal and subdorsal white lines. Spiracles brown. A broad white subventral stripe sharply defined dorsally, fading out ventrally and including ventral apices of the spiracles on median abdominal segments. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head pale brown with darker brown submedian arcs and reticulation.

Described from 2 alcoholic larvae reared at Ithaca, N. Y., May-June 1939, by J. G. Franclemont, and 4 inflated larvae collected near Green Village, N. J., May 10, by Charles Rummel.

*Distribution*.—Wisconsin, Illinois, North Carolina, Maryland, New Jersey, Pennsylvania, Connecticut, Massachusetts, New Hampshire, New York, and Maine.

*Food plant*.—Chokecherry (*Prunus virginiana*) (teste Franclemont).

## AMPHIPYRINAE, GROUP 2

The characters usually employed in separating genera either are closely similar throughout or are not constant in this group, the members of which are differentiated as species in the following key.

1. Spiracles black. With a segmental series of dark dorsal markings. Distribution east of the Rocky Mountains.----- *Xylotype capax*  
Spiracles brown, white or yellow. Without a segmental series of dark dorsal markings. Distribution west of the Rocky Mountains.----- 2
2. Spiracles white.----- 3  
Spiracles brown, sometimes varying to yellow in Fishia.----- 4
3. Setigerous tubercle II<sup>p</sup> on mesothorax with a sclerotized bar contrasting in color with adjacent parts and connecting the tubercle with the ventral muscle attachment. With a dusky or black longitudinal line at the spiracles. Venter green often tinged with purplish.----- *Platypota contadina*  
Setigerous tubercle II<sup>p</sup> on mesothorax without a visible sclerotized bar. No dark longitudinal line at the spiracles. Venter clear green.--- *Dryotype opina*

4. Abdominal segments 7 and 8 distinctly broadened. Venter brown. Cervical shield blackish..... *Hillia maida*  
 Abdominal segments of approximately equal width throughout. Venter green. Cervical shield not blackish..... 5
5. Base of claw broadly rounded, without a tooth or angulation. Dorsum of abdominal segments paler posteriorly in an area adjacent to the middorsal line..... *Mniotype versuta*  
 Base of claw distinctly toothed. Abdominal segments without a paler area posteriorly adjacent to the middorsal line..... 6
6. Mandible with a stout, truncate basal process..... *Fishia evelina*  
 Mandible with a thin tooth arising basally from rib 2..... *Fishia yosemitae*

## XYLOTYPE Hamp.

## XYLOTYPE CAPAX (G. &amp; R.)

Head 3 to 3.2 mm. broad. Body about 30 mm. long and 4.5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color gray.

Middorsal and subdorsal pale lines nearly obsolete. Dorsum of each abdominal segment darker on anterior half with rather ill-defined dark spots including setigerous tubercles I and II. An ill-defined dark stripe including III, extending nearly to the spiracles and intensified to form oblique dark spots dorso-anterior to them. Spiracles black, in the subventral stripe. Subventral pale stripe broad, including V, invaded somewhat by dark reticulation about and below the spiracles. Venter of dilute dorsal coloration, somewhat tinged with purplish. Setigerous tubercles minute. Head with brown submedian arcs and full brown to reddish reticulation.

Described from 4 alcoholic larvae reared at Horseheads, N. Y., in May, 1939, by J. G. Franclemont, and 1 inflated larva collected near Lakehurst, N. J., June 4, by Charles Rummel.

*Distribution.*—United States: Pennsylvania, New Jersey, New York, Massachusetts, New Hampshire, and Maine. Canada: Nova Scotia and Ontario.

*Food plant.*—Chokecherry (*Prunus virginiana*) (teste Franclemont).

## PLATYPOLIA Grt.

## PLATYPOLIA CONTADINA (Sm.)

Head 3 to 3.1 mm. broad. Body about 35 mm. long and 5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color varying from green through light brownish gray to dark, infuscated purplish brown.

Dorsum to the spiracles of the general color except as indicated. Middorsal and subdorsal pale lines inconspicuous, margined by a dark shade. A straight dark line on or near the line of the spiracles. Spiracles white, in the subventral stripe on median abdominal segments. Subventral stripe narrow, white, tending to fade out ventrally. Venter green tinged with purple, particularly to base of prolegs. Setigerous tubercles minute. Head pale greenish or brownish, without markings or with brownish or dilute fuscous submedian arcs and reticulation.

Described from numerous larvae collected east of the Cascade Mountains in Washington and Oregon from the latter part of June to the latter part of July. Moths emerged in August, and were determined by Benjamin.

*Distribution.*—United States: California, Oregon, and Washington. Canada: British Columbia.

*Food plants.*—Willow, alder, *Vaccinium*, Indian-plum (*Osmaronia cerasiformis*), snowberry (*Symphoricarpos*), and probably herbs.

## DRYOTYPE Hamp.

## DRYOTYPE OPINA (Grt.)

Head 2.8 mm. broad. Body about 30 mm. long and 4.5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color green.

Middorsal and subdorsal white lines inconspicuous. Body of uniform shade dorsally and ventrally. Spiracles white, dorsad of the subventral stripe. Subventral pale stripe represented by a white line dorsally, fading out ventrally. Setigerous tubercles minute. Head green, faintly tinged with brownish, unmarked.

Described from 12 larvae collected near Puyallup, Wash., in May by S. E. Crumb, Jr., and the writer. Three moths emerged in September, and were determined by Clarke.

*Distribution.*—United States: California, Oregon, Washington, and Alaska. Canada: British Columbia and Alberta.

*Food plant.*—A legume (*Lathyris?*).

## HILLIA Grt.

## HILLIA MAIDA (Dyar)

Head 3 mm. broad. Body about 33 mm. long and 4 mm. broad, distinctly broadened on abdominal segment 8; skin smooth; general color uniform brown.

Obscure middorsal and subdorsal pale lines outlined by darker brown. Spiracles dark brown, set in a small pale area. Subventral stripe tinged with orange including the spiracles except on 7 and 8. Venter brown. Setigerous tubercles minute. Head yellowish with inconspicuous brown submedian arcs and reticulation.

Described from two larvae: 1 collected August 7, 1930, in Paradise Valley at foot of Mount Rainier at night, the other collected at Carbon River entrance to Mount Rainier June 28, 1936, by W. W. Baker. A moth emerged from the first specimen September 11, 1930, and was determined by Heinrich.

*Distribution.*—United States: California and Washington. Canada: British Columbia and Alberta.

*Food plant.*—Willow.

## MNIOTYPE Franc.

## MNIOTYPE VERSUTA (Sm.)

Head 3.1 to 3.2 mm. broad. Body about 35 mm. long and 6 mm. broad, abdominal segments of about equal width to 8; skin smooth; general dorsal color nearly uniform brown.

Middorsal and subdorsal pale lines obscure, with obscure dark margins which, in the middorsal line, are fused to form a series of small dark spots at juncture of abdominal segments. Abdominal segments paler posteriorly in an area adjacent to the middorsal line. Spiracles pale brown, entirely within the subventral stripe on abdominal segments 4, 5, and 6 only. Subventral pale stripe margined dorsally by a white line, fading out ventrally. Venter green flecked with white. Setigerous tubercles minute. Head greenish with pale brown reticulation.

Described from five inflated larvae from U. S. National Museum labeled "No. 1296, Kaslo Cr., B. C. Collection H. G. Dyar."

*Distribution.*—United States: New Mexico, Colorado, Idaho, Washington, and Montana; also Alaska. Canada: British Columbia and Alberta.

*Food plant.*—Unknown.

## FISHIA Grt.

## FISHIA EVELINA (French)

Head 3.1 to 3.3 mm. broad. Body about 40 mm. long and 5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color varying from soft brownish gray to purplish brown.

Coloration to the spiracles rather uniform except as indicated. Middorsal and subdorsal pale lines inconspicuous, obscurely margined by dark lines. Spiracles varying from orange yellow to bright yellowish brown. A white line in the line of the spiracles and above them on 4, 5, and 6 represents the dorsal margin of the subventral stripe which, otherwise, is not developed. Venter pale, sometimes tinged with purplish. Setigerous tubercles minute. Head brown, unmarked or with faint brown submedian arcs and reticulation.

Described from 20 larvae collected in Washington east of the Cascade Mountains from about the middle of June until the latter part of July. Moths emerged in August, and were determined by Benjamin and by Clarke. This larva is green in earlier instars.

*Distribution.*—United States: Utah, Nevada, California, Washington, and Montana. Canada: British Columbia.

*Food plants.*—Antelope-brush (*Kunzia*), rabbitbrush (*Chrysothamnus*), and *Balsamorhiza*.

## FISHIA YOSEMITAE (Grt.)

Head 3.2 to 3.4 mm. broad. Body about 40 mm. long and 5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color varying from greenish gray through dull purplish green to pale brown.

Coloration uniform to and partially including the spiracles except that the dorsum may be slightly paler than the supraspiracular area. Middorsal and subdorsal pale lines inconspicuous, margined by dark lines. Spiracles yellow or pale brown. No subventral pale stripe. Venter brighter green. Setigerous tubercles minute. Head pale brown, unmarked or with green or brown submedian arcs and reticulation.

Described from 18 larvae collected in Washington from late in May to the latter part of July. Moths emerged late in September, and were determined by Benjamin and by Heinrich.

*Distribution.*—United States: Arizona, California, Colorado, Washington, and Montana. Canada: British Columbia.

*Food plants.*—Goldenrod (*Solidago*), mullein (*Verbascum*), and *Eriogonum*.

## AMPHIPYRINAE, GROUP 3

1. Labial palpus, at least, nearly as long as the spinneret (43:47). Blade of the maxillulae either without teeth or with very obscure traces of teeth. Setigerous tubercles I and II on abdominal segments minute, inconspicuous; both of these tubercles on abdominal segment 2 at nearly the same level in relation to the middorsal line and, hence, setigerous tubercle III but slightly nearer to II than to I (70:74)----- Genus No. 12  
Labial palpus not more than approximately two-thirds as long as the spinneret (32:49)----- 2
2. Setigerous tubercles I and II and their setae readily seen; both these tubercles on abdominal segment 2 at much the same level in relation to the middorsal line and, hence, setigerous tubercle III but slightly nearer to II than to I (53:57). Blade of the maxillulae without teeth or with very obscure indications of teeth----- *Lithophane*  
Setigerous tubercles I and II and their setae minute, very inconspicuous; I much farther dorsal than II and, hence, III on abdominal segment 2 much nearer to II than to I (53:75). Teeth on blade of maxillulae well developed but not conspicuous----- *Pyreferra*

## GENUS No. 12

## "GRAPTOLITHA" DILATOCULA (Sm.)

Head 3.3 to 3.5 mm. broad. Body about 35 mm. long and 6 mm. broad, very blunt posteriorly with abdominal segments 7 and 8 slightly broadened; skin smooth; general color green, sometimes with dark dorsal markings, and becoming purplish before pupation.

Body green throughout flecked with white except as indicated, becoming purplish as pupation approaches. The dark body markings described below may be entirely absent. Very slender pale lines middorsally and dorsad of setigerous tubercle III. A stronger pale line ventrad of II. A segmental series of broad dark spots anterior to II and including I. Spiracles white. An obscure pale line in the line of the spiracles represents the dorsal margin of the subventral pale stripe which, otherwise, is not developed. Setigerous tubercles minute. Head roughened by impressed lines, greenish white with green or darker reticulation.

Described from eight larvae collected at the old north entrance to Mount Rainier in Washington late in July. The larvae remained on the foliage of the food plant during the day. Three moths emerged near the middle of September, and were determined in part by Benjamin and in part by Clarke. Moths Nos. 191, 192, and 716 in U. S. National Museum.

*Distribution.*—United States: California, Nevada, and Washington. Canada: British Columbia.

*Food plant.*—Alder.

## LITHOPHANE Hbn.

## (GRAPTOLITHA Hbn.)

1. General color gray with dark dorsal markings..... 8  
General color green without dark dorsal markings..... 2
2. With a slender, broken, white subventral line, the width on anterior abdominal segments equal to less than half the spiracle height. Distribution limited to the northeastern United States and the adjacent Provinces of Canada..... *baileyi*  
With a continuous pale subventral stripe, the width equal to at least the spiracle height..... 3
3. With a middorsal white line, the width on anterior abdominal segments equal to one-sixth the space between setae I (10:60) or less..... 5  
With a middorsal white stripe, the width on anterior abdominal segments equal to one-fourth the space between setae I (20:70) or more..... 4
4. Width of subventral pale stripe on anterior abdominal segments equal to twice height of spiracle and including only the ventral apices of the spiracles. Of general distribution..... *georgii*  
Subventral white stripe extremely broad, including the spiracles near the centre, the width equal to approximately five times the spiracle height. Distribution limited to areas east of the Rocky Mountains..... *laticinerea*
5. Subventral stripe white marked with red, with a yellow ventral enlargement on each abdominal segment. Skin smooth. Distribution limited to the Pacific coast..... *contenta*  
Subventral pale stripe approximately uniform in width and not marked with red..... 6
6. Width of subventral stripe on anterior abdominal segments equal to approximately three times the height of the spiracle (50:18). Legs mostly black. Skin without coarse granules. Distribution limited to areas east of the Rocky Mountains..... *antennata*  
Width of subventral pale stripe but slightly greater than height of spiracle (20:10). Legs pale or pale green. Skin bearing numerous coarse, convex granules..... 7

7. Spiracles white. Distribution limited to areas west of the Rocky Mountains  
Spiracles dark, probably black. Distribution limited to areas east of the Rocky Mountains *pertorrida*
8. The dark spots between setigerous tubercles I and II on the abdomen produced dorso-posteriorly to outline a segmental series of dark shield-shaped figures. A black line or stripe including the spiracles. The diameter of setigerous tubercle I on abdominal segment 1 equal to approximately one-half the space between margins of tubercles I and II or less *unimoda*
- The dark spots between I and II extended directly posterior to I, not outlining a segmental series of dark shield-shaped figures on the abdomen. No black line or stripe including the spiracles, this being replaced by a few very irregular black spots. Setigerous tubercle I on abdominal segment 1 very large, the diameter greater than the space between margins of tubercles I and II (27:20) *patifacta*
9. Subventral stripe a clear yellowish, sharply defined *bethunei*  
Subventral stripe obscured by dark reticulation and tinged with colors other than yellow *10*
10. Dark reticulation of head extending to the occipital angle medially leaving but a small unmarked area on each side posteriorly. Setigerous tubercle I on abdominal segment 1 small, the transverse width usually equal to but one-third the space between margins of tubercles I and II. Generally distributed *disposita*
- A broad, continuous, unmarked area posteriorly across occiput. *11*
11. Spiracles not enclosed ventrally by the black spiracular line which is widely broken at the incisures. Distribution limited to the northeastern United States and the adjacent Provinces of Canada *semivista*
- Spiracles enclosed ventrally by the continuous, black subventral stripe. *12*
12. Anal shield black medially, infuscated brown laterally. Subventer reticulate with black to base of prolegs. Distribution limited to the northeastern United States and the adjacent Provinces of Canada *oriunda*  
Anal shield black medially, pale laterally. Subventer pale flecked with white to base of prolegs. Of general distribution *innominata*

## LITHOPHANE BAILEYI Grt.

Head 3.3 mm. broad. Body about 35 mm. long and 5 mm. broad, abdominal segments of about equal width throughout to 8; skin smooth; general color green.

Green with slender, broken white lines mid dorsally, subdorsally, dorsad of setigerous tubercle III and ventrad of the spiracles; the middorsal line most nearly continuous with the width on anterior abdominal segments equal to approximately one-ninth the space between setae I; the width of the subventral line equal to less than half the height of the spiracle on anterior abdominal segments. Spiracles white. Setigerous tubercles small, slightly convex, white. Head green, apparently unmarked.

Described from two alcoholic larvae reared at Ithaca, N. Y., April-May 1941, by J. G. Franclemont.

*Distribution.*—United States: Pennsylvania, Massachusetts, New York, and New Hampshire. Canada: Ontario, Quebec, and Nova Scotia.

*Food plant.*—Chokecherry (*Prunus virginiana*) (teste Franclemont) and apple.

## LITHOPHANE GEORGII Grt.

Head 3.6 to 3.8 mm. broad. Body about 32 mm. long and 6 mm. broad, abdominal segments of about equal width to 8; skin roughened but not granulose; general color green.

Body green throughout except as noted, suffused with whitish dorsally. A white middorsal stripe, the width on anterior abdominal segments equal to approximately one-fourth the space between setae I (20:70). A narrow white line well ventrad of II. A broken, slender white line dorsad of III. Spiracles white. Subventral stripe yellow with white dorsal margin, the width on anterior

abdominal segments equal to approximately twice the height of the spiracle (18:10). Venter green. Setigerous tubercles rather large, slightly elevated, white. Head grayish green with darker green reticulation.

Described from numerous larvae collected in Washington from late in May to early in July. Moths emerged in August and September, and were determined by Benjamin and by McDunnough. Eggs deposited April 3, 1941, hatched April 19, and the larvae were mature June 7, 1941.

*Distribution*.—Arizona, California, Utah, Colorado, Oregon, Washington, Montana, Nebraska, Pennsylvania, New York, Massachusetts, New Hampshire, Maine, and the adjacent Provinces of Canada excepting Saskatchewan and New Brunswick.

*Food plants*.—Apple, antelope-brush (*Kunzia tridentata*), ocean-spray (*Hododiscus*), alder, and raspberry.

#### LITHOPHANE LATICINEREA (Grt.)

Head 3.2 mm. broad. Body about 30 mm. long and 4.5 mm. broad, abdominal segments of approximately equal width to 8; skin with some coarse granules in the white markings; general color green.

A middorsal white stripe, the width on anterior abdominal segments equal to about one-third the space between setae I (20:60). A broad white line just ventrad of II. An extremely broad white band including III and the spiracles with V just ventrad of the ventral margin. Spiracles white. Setigerous tubercles rather large, distinctly elevated, white. Head green, roughened, apparently unmarked.

Described from two alcoholic larvae reared at Ithaca, N. Y., April-May 1941, on chokecherry by J. G. Franclemont.

*Distribution*.—United States: Illinois, Minnesota, North Carolina, Pennsylvania, New Jersey, Massachusetts, New York, and Maine. Canada: Nova Scotia, Quebec, and Ontario.

*Food plant*.—Chokecherry (teste Franclemont) and apple.

#### LITHOPHANE CONTENTA Grt.

Head 3.7 mm. broad. Body about 28 mm. long and 6 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color green.

Body green throughout, flecked with white and without a whitish dorsal suffusion. Middorsal white line slender, the width on anterior abdominal segments equal to approximately one-seventh the space between setae I (7:50). A much broken, indefinite white line well ventrad of II. Spiracles white. Subventral white stripe marked with red; broadened and yellow postero-ventrad of the spiracle, the width equal to slightly more than height of spiracle (20:16). Setigerous tubercles of moderate size, distinctly elevated, white. Head green, closely freckled with white.

Described from eight larvae collected in Washington from late in May to early in June. Four moths emerged in September, and were determined by Clarke.

*Distribution*.—United States: California and Washington. Canada: British Columbia.

*Food plant*.—Oak.

#### LITHOPHANE ANTENNATA (Wlk.)

Head 3.4 mm. broad. Body about 35 mm. long and 5 mm. broad, abdominal segments of about equal width throughout to 8; skin smooth; general color green.

Middorsal white line broad, width equal to one-sixth the space between setae I (10:60) on anterior abdominal segments. A much broken white line well

ventrad of II. Only a few white flecks elsewhere on the dorsum. Spiracles white. A broad white subventral stripe partially including the spiracles on abdominal segments 3 to 7, the width equal to nearly three times the height of the spiracle on anterior abdominal segments (50:18). Venter green. Setigerous tubercles rather large, somewhat elevated, white. Head green, roughened but not granulose, unmarked.

Described from three alcoholic larvae reared from the egg at Ithaca, N. Y., April-May 1940, on wild cherry by J. G. Franclemont and a number of alcoholic and inflated larvae in the U. S. National Museum. Moths are said to emerge in September and October, and were taken in bait traps at Clarksville, Tenn., from early in November to early in December 1916.

*Distribution.*—United States: Missouri, Tennessee, Virginia, Illinois, Wisconsin, Maryland, Pennsylvania, New Jersey, Massachusetts, New York, New Hampshire, and Maine. Canada: Nova Scotia.

*Food plants.*—Apple, plum, elm, maple, willow, hickory, and wild cherry.

#### LITHOPHANE PERTORRIDA (McD.)

Head 3.8 mm. broad. Body about 30 mm. long and 5 mm. broad, abdominal segments of approximately equal width to 8; skin coarsely granulose; general color green.

Body green flecked with white throughout except as noted. A strong, narrow, continuous, white middorsal line, the width on anterior abdominal segments equal to about one-sixth the space between setae I (8:52). The white line ventrad of II indicated by isolated white flecks. Spiracles white. A narrow, yellowish subventral stripe, the width approximately equal to height of spiracle (20:18). Venter green. Setigerous tubercles of moderate size, broadly convex, white. Head coarsely granulose laterally, whitish with faint green reticulation.

Described from seven larvae collected in Washington in June by W. W. Baker and the writer. Three moths emerged in August and September, and were determined by Benjamin and by Clarke.

*Distribution.*—United States: California and Washington. Canada: British Columbia.

*Food plants.*—Chokecherry (*Prunus*) and willow.

#### LITHOPHANE UNIMODA (Lint.)

Head 3.5 to 3.8 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, abdominal segments tapering somewhat posteriorly; skin bearing coarse granules; general color green.

Body green throughout much flecked with white, the flecks composed of coarse granules. Middorsal white line slender, broken, the width on anterior abdominal segments equal to approximately one-ninth the space between setae I (6:57). White line ventrad of II obscure or absent. Spiracles black. A subventral white stripe without enlargements on ventral margin, the width approximately equal to height of spiracle (25:22). Venter green. Setigerous tubercles of moderate size, gently convex, white. Head green, pavement-granulose with coarse granules laterally.

Described from two alcoholic larvae reared at Ithaca, N. Y., April-May 1940, on chokecherry, by J. G. Franclemont.

*Distribution.*—United States: Colorado, Nebraska, Illinois, Pennsylvania, New Jersey, Connecticut, Massachusetts, New York, and Maine. Canada: Manitoba, Ontario, and Quebec.

*Food plant.*—Chokecherry (*Prunus*).

## LITHOPHANE PATEFACTA (Wlk.)

Head 2.9 mm. broad. Body about 30 mm. long and 4.5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color very pale gray.

Dark markings very sparse. Middorsal and subdorsal white lines broad, somewhat broken. A segmental series of irregular black spots not forming shield-shaped figures but margining the subdorsal line anterior to setigerous tubercle II and then extending directly posterior to I. A few very irregular black spots in the supraspiracular area, one of which includes the spiracle on each segment. Spiracles white. Subventral white stripe narrow, occupying about half the space between the ventral ends of the spiracles and V. Venter pale. Setigerous tubercles large, entirely flat, white. Head pale with black submedian arcs and reticulation, a large pale area posteriorly crossing the occiput.

Described from two alcoholic larvae reared at Ithaca, N. Y., April-May 1941, on chokecherry by J. G. Franclemont.

*Distribution.*—Maryland, Pennsylvania, New Jersey, New York, and Vermont.

*Food plant.*—Chokecherry (*Prunus virginiana*).

## LITHOPHANE BETHUNEI (G. &amp; R.)

Head 3 to 3.1 mm. broad. Body about 32 mm. long and 4.5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color gray.

Rather uniformly dark reticulate to the spiracles except as indicated. Middorsal and subdorsal white lines broken, inconspicuous. A segmental series of diffuse black spots arising subdorsally anteriorly on abdominal segments, curving between setigerous tubercles I and II and extending dorso-posteriorly toward the middorsal line, outline a series of inconspicuous shield-shaped figures. Traces of a pale line dorsad of III. A sinuous black line including all of the spiracles. Spiracles white. A clear, sharply defined yellowish subventral stripe. Venter pale. Setigerous tubercles of moderate size, somewhat convex, white. Head pale with dilute black submedian arcs and reticulation.

Described from two alcoholic larvae reared at Ithaca, N. Y., April-May 1941, on chokecherry by J. G. Franclemont.

*Distribution.*—United States: Iowa, Wisconsin, Illinois, Minnesota, Ohio, Pennsylvania, New Jersey, New York, Connecticut, Massachusetts, New Hampshire, and Maine. Canada: Nova Scotia, Quebec, and Manitoba.

*Food plants.*—Chokecherry, maple, apple, oak, willow, and ash.

## LITHOPHANE DISPOSITA Morr.

Head 3 to 3.1 mm. broad. Body about 35 mm. long and 5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color gray with dark markings.

Body to and including the spiracles reticulate with dilute blackish on a pale ground. A strong but not conspicuous brownish middorsal line margined by dark lines. A series of blackish markings on abdominal segments curving between setigerous tubercles I and II; outlining a series of shield-shaped figures and bordered ventrally by a brownish line. Traces of a pale line dorsad of III. Ventral half of supraspiracular area darker than dorsal half, somewhat sinuous and bordered ventrally by a black line, including all of the spiracles. Spiracles white. A pale subventral stripe flecked with yellowish and tinged with pink, fading out ventrally. Venter pale flecked with yellowish. Setigerous tubercles small, very slightly elevated, pale. Head white with dilute blackish submedian arcs and full reticulation.

Described from 6 live larvae collected in eastern Washington in May by J. F. Gates Clarke, and 2 alcoholic specimens reared at Ithaca, N. Y., April-May 1940, by J. G. Franclemont. Three moths emerged in August and early September and were determined by Benjamin.

*Distribution.*—United States: Washington, Montana, South Dakota, Illinois, Pennsylvania, New York, Massachusetts, New Hampshire, and Maine. Canada: Quebec and Manitoba.

*Food plants.*—Willow, chokecherry (*Prunus*).

#### LITHOPHANE SEMIUSTA Grt.

Head 2.9 mm. broad. Body about 32 mm. long and 4.5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general dorsal color dark gray.

Dorsum rather uniformly dark reticulate to the spiracles except as indicated. Middorsal and subdorsal white lines broken. A segmental series of diffuse black spots on abdominal segments arising subdorsally anteriorly, curving between setigerous tubercles I and II and extending dorso-posteriorly toward the middorsal line, outline a series of shield-shaped dorsal figures. Black line partially including the spiracles broadly broken at the incisures. Spiracles white, their ventral apices in the pale subventral stripe. Venter pale. Setigerous tubercles of moderate size, gently convex, white. Head pale with black submedian arcs and reticulation, a large black area above antennal insertion.

Described from two alcoholic larvae reared at Ithaca, N. Y., April-May 1941, on chokecherry by J. G. Franclemont.

*Distribution.*—United States: Pennsylvania, New York, and New Hampshire. Canada: Quebec and Ontario.

*Food plant.*—Chokecherry (*Prunus*).

#### LITHOPHANE ORIUNDA Grt.

Head 3 to 3.1 mm. broad. Body about 34 mm. long and 4.5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color gray.

Middorsal and subdorsal pale lines rather broad but not conspicuous, of about equal width, the subdorsal strongly tinged with purplish. A segmental series of dark spots arising subdorsally anteriorly on abdominal segments, curving between setigerous tubercles I and II, and extending dorso-posteriorly toward the middorsal line, outline a series of shield-shaped figures. A black stripe including III and all of the spiracles, strongly narrowed posterior to III on each segment. Spiracles white. Subventral pale stripe tinged with purplish. Venter to base of prolegs reticulate with black. Setigerous tubercles small, flat, pale. Head pale with black submedian arcs and reticulation, a broad pale area posteriorly.

Described from two alcoholic larvae reared at Ithaca, N. Y., April-May 1941, on chokecherry by J. G. Franclemont.

*Distribution.*—United States: Wisconsin, Pennsylvania, New York, and Vermont. Canada: Quebec.

*Food plant.*—Chokecherry (*Prunus virginiana*).

#### LITHOPHANE INNOMINATA (Sm.)

Head 3.1 to 3.3 mm. broad. Body about 35 mm. long and 5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color light gray to brownish gray.

Dorsum to and including the spiracles unicolorous gray flecked with yellowish except as noted. A broad but often broken yellowish or pinkish middorsal line, a similar line ventrad of setigerous tubercle II and traces of a pale line dorsad of III. A segmental series of dark spots on abdominal segments originating subdorsally, curving between I and II and extending dorso-posteriorly toward the middorsal line, outline a series of shield-shaped figures. A black line including all of the spiracles. Spiracles white. Subspiracular stripe pinkish or yellowish, sometimes ill-defined or absent, fading out ventrally. Venter pale flecked with white. Setigerous tubercles of moderate size, almost flat, pale. Head white with black submedian arcs and reticulation.

Described from many larvae collected in Washington from about the middle of June until the middle of July. Moths emerged in August and early September, and were determined by Benjamin.

*Distribution.*—New Mexico, Colorado, Oregon, Washington, Pennsylvania, New York, Maine, and all of the adjacent Provinces of Canada except Saskatchewan.

*Food plants.*—Apple, willow, alder, and blackberry.

#### PYREFERRA Franc.

*Pyreferra hesperidago* (*indirecta*) and *P. ceromatica* are closely similar in structure and their coloration has been destroyed by the preservative in the material at hand. Pearsall's brief description of "*indirecta*" is available but no description of *ceromatica* has been seen.

Rim of spiracle brown. Head of mature larva 3.6 to 3.8 mm. broad at maturity

Rim of spiracle black with ends brown. Head of mature larva 3.2 to 3.4 mm. broad. *Pyreferra ceromatica*  
----- *Pyreferra hesperidago* (*indirecta*)

#### PYREFERRA CEROMATICA (Grt.)

Head 3.6 to 3.8 mm. broad. Body about 30 mm. long and 5 mm. broad, abdominal segments of about equal width throughout to 8; skin smooth; general color probably whitish, apparently with some darker reticulation dorsally.

Coloration indeterminate in the material at hand. Spiracles white with brown rim. Setigerous tubercles and their setae very minute.

Five alcoholic larvae have been examined, collected near Fremont, Ind., June 12, 1937, by A. K. Wyatt.

*Distribution.*—United States: Indiana, Pennsylvania, New Jersey, New York, New Hampshire, and Maine. Canada: Ontario.

*Food plant.*—Witch-hazel (*Hamamelis*).

#### PYREFERRA HESPERIDAGO (Grt.) (INDIRECTA Wlk.)

Head 3.2 to 3.4 mm. broad. Body about 35 mm. long and 5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color whitish.

The specimens at hand are completely decolorized by the preservative. Pearsall (34) gives the following description:

Length full grown 1.45 in., smooth. Head smooth, glossy, semitransparent. Each segment above is chalky white, becoming translucent between the segments and traversed through the centre with a pale lemon-yellow band. Feet and underparts dirty white.

Five alcoholic larvae have been examined, received from the Maine Agricultural Experiment Station through the kindness of J. H. Hawkins. Pearsall (*loc. cit.*) states that larvae are mature in June and spend the summer in the soil, pupating in September.

*Distribution.*—United States: Indiana, Maryland, Pennsylvania, Connecticut, Massachusetts, New York, and Maine. Canada: Ontario.

*Food plant.*—Witch-hazel (*Hamamelis*).

#### AMPHIPYRINAE, GROUP 4

This is a heterogeneous assemblage of genera drawn from both the Amphipyrinae and the "Cuculliinae." Owing to diversity among the genera, and in some cases among the species in each group, the erection

of a reasonably reliable key has been difficult. The character of setigerous tubercle II<sup>o</sup> on the mesothorax, as used in couplet 1 of the following key, is usually but slightly variable, but is obscure and quite variable in *Brachyotomia* which is included in both categories of this couplet.

1. Setigerous tubercle II<sup>o</sup> on mesothorax with a dark sclerotized bar contrasting in color with adjacent parts and connecting the tubercle with the adjacent ventral muscle attachment (pl. 7, P'). Length of spinneret usually equal to decidedly more than four times the median width. Spiracles black, brown, or orange except white in *Euplexia*..... 2
- Setigerous tubercle II<sup>o</sup> on mesothorax without a visible sclerotized bar connecting the tubercle with the adjacent ventral muscle attachment (pl. 7, O) except in *Lycanades* and *Aseptis adniza*. Length of spinneret equal to four times the median width or less except in *Ipmorpha*. Spiracles white or whitish except pale brown in *Cosmia* and black in *Zotheca*..... 9
2. Midventral row of muscle attachments between the prolegs on abdominal segment 3 divided anteriorly forming a Y except in *Homoglaea californica* in which the spiracles are black and the head is freckled with black<sup>22</sup> (pl. 8, G)..... 3
- Midventral row of muscle attachments between the prolegs on abdominal segment 3 forming a line..... 6
3. Labial palpus less than half as long as the spinneret (26:60), with the third segment less than half as long as the basal segment (7:18) -- *Xystocephalus*  
Labial palpus at least nearly as long as the spinneret with the third segment more than half as long as the basal segment..... 4
4. Spinneret slender but grooved dorsally. Setigerous tubercle II<sup>o</sup> on metathorax usually with a sclerotized bar connecting the tubercle with the adjacent ventral muscle attachment. Anterior half of head black in mature larvae. Spiracles black..... *Eupsilia*  
Spinneret, at most, with a slender, impressed dorsal line. With a smaller black area above antennal insertion. Spiracles brown, except black in *Homoglaea californica*..... 5
5. Setigerous tubercle II<sup>o</sup> on metathorax with a dark sclerotized bar connecting the tubercle with the adjacent ventral muscle attachment (pl. 7, U). Postero-median setigerous tubercles on anal shield much nearer to each other than to the postero-lateral tubercles (8:13). With a segmental series of black subdorsal markings..... *Lilholomia*  
Setigerous tubercle II<sup>o</sup> on the metathorax without a sclerotized bar (pl. 7, T). Postero-median tubercles on anal shield at least as far from each other as from the postero-lateral tubercles. Without black subdorsal markings. *Homoglaea*
6. Height of prothoracic spiracle almost equal to height of spiracle on abdominal segment 8 (19:20). Postero-median setigerous tubercles on anal shield distinctly farther from each other than from the postero-lateral tubercles (14:10) (pl. 6, E)..... *Brachyotomia*  
Height of prothoracic spiracle decidedly less than height of spiracle on abdominal segment 8 (31:36). Postero-median tubercles on anal shield distinctly closer to each other than to the postero-lateral tubercles (14:20)..... 7
7. Setigerous tubercles II on abdominal segment 8 each set on a small, independent hump. Head infuscated with underlying black freckles showing through the infuscation..... *Hypna*  
Setigerous tubercles II on abdominal segment 8 not set on independent humps. Head with pigment reticulation..... 8
8. Spiracles white. Third segment of labial palpus shorter than the basal segment (15:19)..... *Euplexia*  
Spiracles brown. Third segment of labial palpus as long as basal segment. *Phlogophora*

<sup>22</sup> The arms of the Y are but narrowly separated in *Xystocephalus* and *Homoglaea hircina*.

9. Setigerous tubercle II<sup>b</sup> on mesothorax with a sclerotized bar, contrasting in color with adjacent parts and connecting the tubercle with the adjacent ventral muscle attachment (pl. 7, P)----- 10  
 Setigerous tubercle II<sup>a</sup> on mesothorax without a visible ventral bar (pl. 7, O)----- 11
10. Mandible with a small tooth arising subbasally from rib 2. Setigerous tubercle II<sup>a</sup> on mesothorax with a sclerotized ventral bar----- *Lycanodes*  
 Mandible with a transverse basal structure usually bearing an apical molar area. Setigerous tubercle II<sup>a</sup> on mesothorax without a visible ventral bar----- *Aseptis adnixa*
11. Labrum very broadly, shallowly, emarginate on anterior margin (pl. 10, F). Feeds exclusively on coniferous trees----- *Achytonia*  
 Anterior margin of labrum narrowly emarginate except in *Aseptis fumicola* (pl. 7, L). Do not feed on coniferous trees----- 12
12. Setigerous tubercle O<sup>1</sup> nearly or quite equidistant between ocelli III and IV. With a fleshy prominence basally on ventral face or prolegs----- 13  
 Setigerous tubercle O<sup>1</sup> at least twice as far from ocellus III as from IV. Without a fleshy prominence basally on ventral face of prolegs----- 14
13. Transverse line of setae P<sup>1</sup> below apex of front. Skin set closely with very minute granules. Setigerous tubercles rather large but nearly flat and inconspicuous----- *Ipinorpha*  
 Transverse line of setae P<sup>1</sup> above apex of front. Skin smooth. Setigerous tubercles minute, mere setal insertions----- *Enargia*
14. Height of prothoracic spiracle much greater than height of spiracle on abdominal segment 1 (21:14)----- 15  
 Height of prothoracic spiracle, at most, but a little greater than that of the spiracle on abdominal segment 1 (22:20)----- 16
15. Prolegs on abdominal segments 3 and 4 but slightly smaller than on 5 and 6. Mandible with two small basal teeth. Setigerous tubercle IV on abdominal segment 2 approximately the spiracle width removed therefrom----- *Eremobina*  
 Prolegs on 3 and 4 conspicuously smaller than on 5 and 6, particularly on 3. Setigerous tubercle IV on 2 three or four times the spiracle width removed therefrom----- *Balsa*
16. Setigerous tubercles of body large, flat, black. Head and legs black. Feeds exclusively on elder (*Sambucus*)----- *Zotheca*  
 Setigerous tubercles of body minute. Head and legs not black----- 17
17. Setigerous tubercle IV on abdominal segment 2 the spiracle width or less removed therefrom. Spiracles pale brown. Feeds exclusively on oak----- *Cosmia*  
 Setigerous tubercle IV on 2 more than the spiracle width removed therefrom (14:11). Spiracles white. Do not feed on oak----- *Aseptis*

## XYSTOPEPLUS Franc.

## XYSTOPEPLUS RUFAGO (Hbn.) (ODIA)

Head 2.8 to 3 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments broadening gradually posteriorly to 8; skin smooth; general color pale brown with a contrasting black cervical shield.

Coloration to and partially including the spiracles uniform. Middorsal and subdorsal pale lines slender, broken. Spiracles brown. Subventral stripe yellowish. Midventer pale. Setigerous tubercles minute. Head pale brown with darker brown submedian arcs and reticulation.

Described from four alcoholic larvae from eggs obtained at Fremont, Ind., by A. K. Wyatt, larvae mature June 3, 1935, and one alcoholic specimen reared at Horseheads, N. Y., April-May 1939, by J. G. Franclemont.

*Distribution.*—Texas, Florida (?), Missouri, Illinois, Maryland, Pennsylvania, New Jersey, Massachusetts, and New York.

*Food plant.*—Oak.

## EUPSILIA Hbn.

1. Space between hind coxae nearly or quite equal to width of femur. Two basal teeth present on oral face of mandible. Abdominal segments broadening gradually to 8..... *Eupsilia sidus, tristigmata, and morrisoni*  
 Space between hind coxae equal to approximately half width of femur. One subbasal tooth present on oral face of mandible. Abdominal segments of about equal width to 8..... 2
2. Dorsum and suprascapular area unicolorous, black, without a segmental series of middorsal markings..... *Eupsilia fringata*  
 Dorsum distinctly paler than the suprascapular area, with a segmental series of middorsal dark figures..... *Eupsilia devia*

## EUPSILIA SIDUS (Gn.)

## EUPSILIA TRISTIGMATA (Grt.)

## EUPSILIA MORRISONI (Grt.)

Repeated, persistent efforts have failed to disclose the slightest consistent structural or color difference among members of this trio, and one description will suffice for all.

Head 3 to 3.3 mm. broad. Body about 33 mm. long and 5 mm. broad at middle, broadening gradually posteriorly to abdominal segment 8; skin smooth; general color infuscated brown to deep brownish black.

Dorsum to and partially including the spiracles of one shade, sometimes faintly darker in dorsal half of suprascapular area, and sometimes tinged with purplish in ventral half of this area. Inconspicuous pale lines middorsally and well ventrad of setigerous tubercle II and obscure traces of pale line dorsad of III. Spiracles black. Subventral stripe narrow, yellowish, orange or whitish. Venter to base of prolegs of dilute dorsal coloration strongly tinged with purplish. Mid-venter pale tinged with purplish. Setigerous tubercles minute. Cervical shield black, the subdorsal pale line conspicuous, obscure or absent. Head black on anterior two-thirds, pale or brownish posteriorly with sparse dark reticulation, the dark coloration broken into lines posterior to the ocelli.

## EUPSILIA SIDUS (Gn.)

About 25 larvae have been examined: Two alcoholic specimens reared at Ithaca, N. Y., April-May 1939, on chokecherry by J. G. Franclemont, and about 23 larvae collected near Clarksville, Tenn., in May. These Tennessee larvae entered the soil in May but did not pupate until the latter part of August. Moths were determined by Dyar.

*Distribution.*—United States: Texas, Tennessee, Virginia, Missouri, Iowa, Minnesota, Illinois, Ohio, Maryland, New Jersey, Pennsylvania, Connecticut, Massachusetts, New York, New Hampshire, and Maine. Canada: Nova Scotia, Quebec, Ontario, and Manitoba.

*Food plants.*—Azalea, apple, blackberry, hickory, oak, peach, and wild cherry. Occasionally found on tobacco.

## EUPSILIA TRISTIGMATA (Grt.)

About 20 larvae examined: 2 reared at Ithaca, N. Y., April-May 1939, on chokecherry by J. G. Franclemont, and about 18 larvae collected in Washington in May and up to the middle of June. The

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USDA TECHNICAL BULLETINS

UPDATA

THE LARVAE OF THE PHALAEINIDAE

CRUMB, S. E.

3 OF 4

Washington specimens began to enter the soil for pupation in May. Moths emerged in September, and were determined by Heinrich and by Benjamin.

*Distribution.*—United States: Utah, Washington, Idaho, Montana, Wisconsin, Minnesota, Illinois, Maryland, Pennsylvania, New Jersey, Connecticut, New York, New Hampshire, and Maine. Canada: Manitoba, Alberta, and British Columbia.

*Food plants.*—Strawberry, thimbleberry (*Rubus parviflorus*), apple, and chokecherry (*Prunus demissa*). The smaller larvae web up the blossoms of strawberry and thimbleberry, and feed on the flower parts.

#### EUPSILIA MORRISONI (Grt.)

Three alcoholic larvae have been examined. These were reared at Ithaca, N. Y., April–May 1939, on *Prunus virginiana*, by J. G. Franclemont.

*Distribution.*—United States: Minnesota, Iowa, Illinois, Wisconsin, Ohio, Maryland, Pennsylvania, Connecticut, Massachusetts, New York and Maine. Canada: Quebec.

*Food plant.*—Chokecherry (*Prunus virginiana*).

#### EUPSILIA FRINCATA (B. & McD.)

Head 3.2 to 3.4 mm. broad. Body about 35 mm. long and 5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general dorsal color intense black sometimes tinged very faintly with brown.

Dorsum to and including the spiracles intense, unmarked, black in the mature larva; a conspicuous bluish-white middorsal stripe and a strong bluish-white line ventrad of setigerous tubercle II present in earlier instars. Spiracles black. A conspicuous subventral stripe extending to V, white tinged with yellowish. Venter infuscated brown and maroon. Setigerous tubercles minute. Anterior two-thirds of head intense black, posterior portion a decided brown, area posterior to the ocelli solid black.

Described from about 20 larvae collected east of the Cascade Mountains in Washington from May 29, 1932, to July 5, 1933, near Easton, and at Indian Flat and Sawmill Flat on Highway 410 by Wm. W. Baker and the writer. Moths emerged in September, and were determined by Benjamin.

*Distribution.*—California, Washington, and British Columbia.

*Food plants.*—Most common on *Aster* but taken occasionally on *Solidago*, *Ceanothus velutinus*, and *Amelanchier*. Feeds concealed in webbed-up leaves of *Aster*.

#### EUPSILIA DEVIA (Grt.)

Head 3.1 to 3.3 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, abdominal segments of about equal width to 8; skin smooth; general color varying from yellowish brown to blackish, with the dorsum paler than the supraspiracular area.

Middorsal line distinct but not prominent. A rather distinct pale line well ventrad of II margined dorsally by a dark shade. A segmental series of broadly connected, diffuse, ovoid, middorsal figures composed of blackish reticulation. Supraspiracular area darker dorsally, the dark coloration intensified to form small black spots including the spiracles. Spiracles black. A conspicuous white subventral stripe extending to but not including setigerous tubercle V. Venter reticulate with blackish to base of prolegs, pale midventrally. Setigerous tubercles minute. Anterior two-thirds of head black, pale brown posteriorly with sparse brownish reticulation, the dark coloration broken into reticulation posterior to the ocelli.

Described from numerous larvae including: Two specimens reared from eggs collected at Edgebrook, Ill., by A. K. Wyatt, the larvae being mature June 10, 1933; 1 larva reared at Ithaca, N. Y., April-May 1939, on chokecherry, by J. G. Franclemont; 20 live larvae collected at Bellingham, Wash., May 18, 1934, on *Solidago*, by Wm. W. Baker, and 15 live larvae collected at Pullman, Wash., May 30, 1932, on *Solidago missouriensis*, by J. F. Gates Clarke. Moths emerged in September, and were determined by Benjamin.

*Distribution.*—United States: California, Washington, Minnesota, Colorado, Illinois, Ohio, Pennsylvania, New Jersey, Connecticut, New York, and Maine. Canada: Ontario, Manitoba, Alberta, and British Columbia.

*Food plants.*—Goldenrod (*Solidago missouriensis*), *Aster eatoni*, chokecherry (*Prunus virginiana*).

### LITHOLOMIA Grt.

#### LITHOLOMIA NAPAEA (Morr.)

Head 2.4 mm. broad. Body about 30 mm. long and 4 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color brownish dorsally with segmental dark subdorsal dashes, sides darker.

Middorsal pale line almost obsolete. Pale line ventrad of setigerous tubercle II distinct on posterior half of abdominal segments, obliterated anteriorly. A segmental series of black dashes on abdominal segments 1 to 9, originating subdorsally posteriorly on the segments and extending obliquely between I and II of the following segment. Dorsum paler and more brown than the suprspiracular area. Suprspiracular area darkest at dorsal margin, the dark coloration growing gradually more dilute to base of prolegs, a slight concentration of pale flecks indicating the subventral stripe. Spiracles brown. Setigerous tubercles small dorsally, larger laterally and ventrally, flat, brown. Head brown, front, adfrontal areas, a large spot above antennal insertion and the submedian arcs and reticulation, black.

Described from four larvae collected in eastern Washington at Current Flat and Indian Flat on Highway 410, and near Clearwater Ranger Station near Mt. Adams in July by Wm. W. Baker and the writer. One moth emerged August 17, 1934, and was determined by Benjamin. Another moth emerged August 20, 1935, and was determined by Clarke.

*Distribution.*—New Mexico, California, Nevada, Utah, Colorado, Oregon, Idaho, Washington, Montana, Pennsylvania, New York, Maine; in all of the adjacent Provinces of Canada except New Brunswick and Saskatchewan. Also in Alaska.

*Food plants.*—Alder, cottonwood, and *Spiraea*.

#### HOMOGLAEA Morr.

- |  |                    |
|--|--------------------|
| 1. Hind coxae approximately one-fourth the femur width apart (4:18). Head with infuscated brown or reddish reticulation..... | <i>hircina</i>     |
| Hind coxae two-thirds the femur width apart or more.....   | 2                  |
| 2. Head with black freckles.....   | <i>californica</i> |
| Head with black reticulation.....  | <i>dives</i>       |

#### HOMOGLAEA HIRCINA Morr.

Head 3.3 mm. broad. Body about 35 mm. long and 5.5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color apparently brown.

Uniformly reticulate with infuscated brown to the spiracles. Middorsal pale line obscure. Pale line well ventrad of setigerous tubercle II more distinct.

Spiracles brown. A narrow subventral pale stripe including the ventral apices of the abdominal spiracles except on 7 and 8. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head brown with infuscated brown or reddish submedian arcs and reticulation, reticulation red posterior to the ocelli, a large black area above antennal insertion.

Described from two alcoholic larvae reared at Ithaca, N. Y., April-May 1941, on aspen by J. G. Franclemont.

*Distribution*.—United States: Pennsylvania, Connecticut, New York, New Hampshire, and Maine. Canada: British Columbia, Alberta, Saskatchewan, and Manitoba.

*Food plant*.—Aspen (*Populus tremuloides*).

#### HOMOGLAEA CALIFORNICA (Sm.)

Head 2.6 to 2.7 mm. broad. Body about 35 mm. long and 5.5 mm. broad at middle, broadened slightly posteriorly; skin smooth; general color pale gray suffused faintly with purplish.

Coloration to and partially including the spiracles composed of dilute purplish fuscous reticulation on a pale ground, the dark component somewhat intensified in the line of the spiracles. A strong, continuous, faintly yellowish middorsal line, broadened at posterior margin of abdominal segments except 7 and 8 and margined by dark lines. Pale line well ventrad of setigerous tubercle II inconspicuous. Spiracles black. A subventral band of pale flecks present. Venter distinctly paler than the dorsum and flecked with white. Setigerous tubercles minute. Head pale brown with close black freckles, a large area above antennal insertion and that usually occupied by the submedian arcs unmarked.

Described from 18 larvae collected on White River north of Dieringer, Wash., May 20, 1934. Moths emerged from early in July to early in September, and were determined by Benjamin.

*Distribution*.—United States: California, Oregon, Wyoming, and Washington. Canada: British Columbia.

*Food plant*.—Cottonwood (*Populus*).

#### HOMOGLAEA DIVES Sm.

Head 3 to 3.2 mm. broad. Body about 35 mm. long and 5.5 mm. broad at middle, abdominal segments 7 and 8 slightly broadened; skin smooth; general color dark gray sometimes tinged with brown or purplish.

Dorsum to the spiracles of one shade, except as indicated, composed of a close dark reticulation on a pale ground, more dilute and often tinged with purplish subventrally. Midventer pale, flecked with white and often tinged with purplish. Inconspicuous pale lines middorsally and well ventrad of setigerous tubercle II, both margined by a dark shade. Spiracles brown or orange brown. Subventral stripe pinkish, yellow, or orange, narrow, fading out ventrally. Setigerous tubercles minute. Head pale with front, adfrontal areas, a large area above the antennal insertion, submedian arcs and full reticulation, black.

Described from many larvae collected in Washington during June. Moths emerged throughout September, and were determined by Benjamin and by Clarke. From three larvae collected June 1, 1935, near Tieton, Wash., two moths were reared. These were determined as *Homoglaea carbonaria* Harvey, but the larvae apparently are not distinguishable from those of *dives*.

*Distribution*.—United States: California and Washington. Canada: British Columbia.

*Food plant*.—Poplar (*Populus*).

## BRACHYLOMIA Hamp.

## BRACHYLOMIA POPULI (Stkr.)

Head 2.5 to 2.7 mm. broad. Body about 30 mm. long and 4.3 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color varying from whitish with dark markings more or less obsolete to dark gray with distinct markings. The dark form is described below.

Coloration made up of black spots and reticulation on a pale or purplish ground. A strong middorsal white line margined with black, particularly near juncture of segments. White line with setigerous tubercle II at dorsal margin tending to be obliterated anterior to II by a black spot which extends dorsally as reticulation including I. Spiracles brown. Subventral pale stripe narrow, filled with infuscated purplish reticulation. Venter of dilute dorsal coloration to base of prolegs, pale midventrally. Setigerous tubercles minute. Head brown with darker brown or black submedian arcs and reticulation, a large dark area above antennal insertion.

Described from many larvae collected in Washington in May. Moths emerged in August and early September, and were determined by Benjamin and by Clarke.

*Distribution.*—United States: New Mexico, California, Utah, Colorado, Wyoming, Washington, and Montana. Canada: British Columbia and Alberta.

*Food plants.*—Prefers cottonwood but feeds also, in nature, on hazel, oak, and chokecherry (*Prunus demissa*).

## HYPPA Dup.

## HYPPA BRUNNEICRISTA Sm.

Head 2.8 mm. broad. Body about 35 mm. long and 4.5 mm. broad, abdominal segments of about equal width to 8, dorsum of 8 obliquely declivous with setigerous tubercles II each set on a small but distinct angular hump; skin smooth; general dorsal color pale yellow tinged with brown, the venter distinctly darker.

Coloration to and including the spiracles uniform except as indicated. Middorsal white line more evident near juncture of segments, in a narrow brown stripe. Subdorsal pale line broken, inconspicuous. A segmental series of dark subdorsal marks arising at juncture of segments, curving between I and II when fully developed and bordered dorsally by an oblique pale mark including I. Spiracles pale tinged with orange. A dull white subventral stripe extending to but not including V ventrad of which the body is abruptly darker than the dorsum and tinged with purplish. Setigerous tubercles minute. Head overlaid by smoky brown infuscation with close-set black freckles showing through the infuscation.

Described from 11 larvae, 2 from alder and 9 from fireweed, collected September 28–29, 1938, at White River Camp, Mount Rainier. These larvae continued to feed somewhat into November although becoming no larger than when collected, went through the winter out of doors, and began forming cells for pupation early in March 1939. Two moths emerged May 1, 1939, and, after being determined tentatively as *indistincta* Sm. and *xylinoides* Gn., finally were positively determined as *brunneicrista* Sm. by Franclemont. (Moths Nos. 686 and 687 in U. S. National Museum.) Similar but much darker larvae were beaten from *Spiraea douglasii* at Indian Flat on Highway 410, September 27, 1937.

*Distribution.*—United States: California and Washington. Canada: British Columbia and Alberta.

*Food plants.*—Fireweed (*Epilobium angustifolium*) and alder.

## EUPLEXIA Steph.

## EUPLEXIA BENESIMILIS McD.

Head 2.5 to 2.6 mm. broad. Body about 28 mm. long and 4.5 mm. broad, abdominal segments 7 and 8 slightly broadened; skin smooth; occurs in both a green and a brown phase, the dark markings tinged with purplish brown in the brown phase. The green phase is described below.

Middorsal pale line obscure or absent. Setigerous tubercles II on abdominal segment 8 set in small but distinct round white dots. Coloration made up of dark flecks and strands on a green ground except as indicated. A segmental series of diffuse dark marks on abdominal segments composed of reticulation, arising subdorsally at anterior margin and extending obliquely between I and II to middorsal line at posterior margin, usually obscure posteriorly and tending to outline a series of shield-shaped dorsal figures. A black line dorsal of the spiracles except on 8. A band of pale flecks ventrad of spiracles. Setigerous tubercles minute. Head green with dark reticulation dorsally.

Described from numerous larvae collected in Tennessee and Washington from late in July to October. A moth emerged in May and was determined by Dyar.

*Distribution.*—United States: Colorado, California, Oregon, Washington, Montana, Tennessee, Maryland, Pennsylvania, New Jersey, Massachusetts, New York, New Hampshire, and Maine. Canada: Quebec, Ontario, Manitoba, Alberta, and British Columbia.

*Food plants.*—Ferns, alder, elder, huckleberry, *Aster*, *Helianthus*, *Vagnera amplexicaulis*, foxglove, mint, stinging nettle, *Trillium*, and willow.

## PHLOGOPHORA Tr.

Middorsal pale line inconspicuous but continuous except interrupted at juncture of segments by small black spots. Head setae not in black spots. Length of spinneret equal to eight times median width, or more (70:8) ----- *iris*  
Middorsal line yellow, composed of a short dash at anterior margin of each segment followed by two dots at posterior margin. Head setae in inconspicuous black spots. Length of spinneret equal to five times the median width, or less (38:8) ----- *periculosa*

## PHLOGOPHORA IRIS Gn.

Head 3.4 to 3.5 mm. broad. Body about 35 mm. long and 5.5 mm. broad at middle, abdominal segments 7 and 8 slightly broadened; skin smooth; general color probably gray.

Body to base of prolegs reticulate with dilute black unless otherwise noted. Middorsal pale line inconspicuous interrupted at juncture of segments by small black spots. Pale line ventrad of setigerous tubercle II obsolete. A segmental series of diffuse black markings on abdominal segments composed of reticulation, arising subdorsally at anterior margins of segments and extending obliquely between I and II to the middorsal line at posterior margin, usually more diffuse posterior to II. Spiracles blackish or brown. Subventral pale stripe apparently absent. Setigerous tubercles minute. Head brown with dilute black submedian arcs and reticulation.

Described from three alcoholic larvae collected near Chicago, Ill., September 13, 1940, by A. K. Wyatt.

*Distribution.*—United States: Illinois, Wisconsin, Minnesota, Pennsylvania, New Jersey, Connecticut, New York, New Hampshire, and Maine. Canada: Quebec, Ontario, and Manitoba.

*Food plants.*—Fed in captivity on various herbs, including dandelion, dock (*Rumex*), and thistle (teste Wyatt).

## PHLOGOPHORA PERICULOSA Gn.

Head 3 to 3.2 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, abdominal segments 7 and 8 broadened; skin smooth; general color varying from light brown to dark green.

Dorsal coloration to and including the spiracles uniform except as indicated, consisting of reddish or dilute fuscous reticulation on a yellow, gray, or green ground. Middorsal line yellow, represented on each segment except prothorax by a short dash near anterior margin and two dots near posterior margin. A segmental series of dark marks on abdominal segments composed of reticulation, originating subdorsally at anterior margin of segments and extending dorso-posteriorly between setigerous tubercles I and II to the middorsal line at posterior margin of segments, the spots from each side combining to form a series of V-shaped figures. Spiracles blackish or brown with the extreme center paler. Subventral stripe prominent, yellow, or whitish, sometimes ill-defined ventrally. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head pale brownish to greenish gray with reddish, brownish, or green reticulation, setal insertions in small, inconspicuous black spots.

Described from about 25 larvae collected in western Washington in April and early May. Moths emerged in July and were determined by Benjamin.

*Distribution.*—United States: Washington, Maryland, New Jersey, Pennsylvania, Connecticut, Massachusetts, New York, New Hampshire, and Maine; also Alaska. Canada: Newfoundland, Ontario, Manitoba, Alberta, and British Columbia.

*Food plants.*—Alder, *Vaccinium*, plum, and goatsbeard (*Aruncus sylvestris*).

## LYCANADES Franc.

Mandible with a tooth arising subbasally from the second ventral rib, usually small and sometimes reduced to a mere rounded angulation of the rib. Adfrontal areas of head pale. Found in the lowlands.----- *purpurea*  
Mandible without a subbasal tooth. Adfrontal areas of head dark, the sutures pale. Found at considerable elevation.----- *pulchella*

## LYCANADES PURPUREA (Grt.)

Head 2.7 to 2.9 mm. broad. Body about 30 mm. long and 5 mm. wide, abdominal segments of about equal width to 8; skin smooth; occurs in a brownish or gray phase sometimes tinged with purplish and in a green phase. The brownish or gray phase is described below.

Coloration to and partially including the spiracles composed of uniform dark reticulation sometimes tinged with purplish on a brown or pale ground except as indicated. Middorsal and subdorsal pale lines usually obscure, broken. A segmental series of dark marks on abdominal segments arising subdorsally anteriorly on the segments, curving between setigerous tubercles I and II and extending to the middorsal line at posterior margin of segments when fully developed, tend to outline a series of shield-shaped figures which may be completely filled with the dark color. A dark line at the spiracles. Spiracles white. A broad, sharply defined white subventral stripe sometimes marked with purplish. Venter of dilute dorsal coloration, flecked with white. Setigerous tubercles minute. Head pale with dilute black submedian arcs and reticulation.

Described from many larvae collected in Washington, mostly west of the Cascade Mountains, in May and June. Moths emerged in August and September, and were determined by Benjamin and by Heinrich. Larvae remain in their cells in the soil for 2 months or more before pupation.

*Distribution.*—United States: California, Utah, Oregon, Idaho, and Washington. Canada: British Columbia.

*Food plants.*—Strawberry, thimbleberry (*Rubus parviflorus*), *Iris* seed capsules, chickweed, and *Geranium*.

#### LYCANADES PULCHELLA (Sm.)

Head 2.6 to 2.9 mm. broad. Body about 25 mm. long and 4 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color brownish, no color phases observed.

Body rather uniformly reticulate with brown or infuscated brown except as indicated. Middorsal and subdorsal pale lines slender, broken. A segmental series of dark marks on abdominal segments arising subdorsally, curving between I and II and meeting middorsally at posterior margin of segments outline a series of shield-shaped dark figures which may be entirely filled by the dark color. Spiracles white, included in dorsal margin of the broad, sharply defined pale subventral stripe. Venter of dilute dorsal coloration. Head pale with black submedian arcs and reticulation, the front and adfrontal areas dark.

Described from 25 larvae collected at Signal Peak Ranger Station, near Mount Adams in Washington July 15, 1932, and June 20, 1935, by Joseph Wilcox and the writer. Moths emerged in August, and were determined by Heinrich.

*Distribution.*—United States: Washington. Canada: British Columbia.

*Food plants.*—Lupines and other herbage.

#### ACHYTONIX McD.

##### ACHYTONIX EPIPASCIA (Grl.)

Head 2.7 mm. broad. Body about 28 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin smooth; general color green with prominent white lines.

Green dorsally and ventrally with strong, conspicuous subequal white lines middorsally and ventrad of setigerous tubercle II. A dark line at the spiracles. Spiracles brownish or deep infuscated brown. Subventral stripe yellow, sometimes with a white dorsal line, extending to V. Setigerous tubercles minute. Legs and prolegs green. Head green unmarked excepting a white spot at the ocelli.

Described from 2 larvae collected on Cloud Cap Road, Mount Hood, July 8, 1936, by Wm. W. Baker and S. E. Crumb, Jr., and 4 larvae collected near Parkland, Wash., July 7, 1939, and July 14, 1942. One moth emerged in July and another in August, and these were determined by Clarke. The larvae pupate in silk cocoons spun among the fir needles on the tree.

*Distribution.*—United States: Arizona, California, Colorado, Oregon, Idaho, and Washington. Canada: British Columbia.

*Food plant.*—Douglas-fir (*Pseudotsuga taxifolia*).

#### IPIMORPHA Hbn.

##### IPIMORPHA PLEONECTUSA (Grl.)

Head 3 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering posteriorly; skin set closely with very minute granules; general color green.

A broad white middorsal line narrowing on the thorax. A broken, more slender white line ventrad of setigerous tubercle II. Spiracles white. A narrow, white subventral line. Setigerous tubercles pale, rather large but nearly flat. Tarsi black apically. Head yellowish white, the face margined by a black band extending to the median line above apex of front.

Described from one inflated larva from U. S. National Museum labeled "982, Dyar and Caudell," and four immature alcoholic specimens from U. S. National Museum labeled "On *Populus tremuloides*, Colo., July 5, 1917, Chester Euler coll."

*Distribution*.—United States: Texas, Utah, Colorado, Montana, Iowa, Illinois, Pennsylvania, New Jersey, New York, Massachusetts, New Hampshire, and Maine. Canada: Nova Scotia, Ontario, Manitoba, and British Columbia.

*Food plant*.—Aspen (*Populus tremuloides*).

### ENARGIA Hbn.

#### ENARGIA DECOLOR (Wik.)

Head 3.1 to 3.2 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color uniform pale yellowish green.

A strong, continuous but inconspicuous whitish middorsal line. A more slender, inconspicuous pale line ventrad of setigerous tubercle II. Spiracles dull white, included in the subventral stripe which is scarcely different in color from remainder of body except that it is margined by distinct white lines. Setigerous tubercles minute. Head pale, unmarked.

Described from 12 larvae collected in Washington in May. Moths emerged in June, and were determined by Clarke. The larvae live in a flat case made by fastening two leaves together with silk.

*Distribution*.—United States: Arizona, California, Nevada, Utah, Colorado, Wyoming, Washington, Montana, Kansas, Nebraska, Pennsylvania, New York, Maine, the adjacent Provinces of Canada, and Alaska.

*Food plants*.—Cottonwood and aspen.

### EREMOBINA McD.

#### EREMOBINA HANHAMI (B. & B.)

Head 2.8 mm. broad. Body about 30 mm. long and 4 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color pale olivaceous green.

Continuous, inconspicuous pale middorsal and subdorsal lines, all crossing the anal shield. Spiracles white, in the subventral pale stripe the ventral margin of which is obscure. Venter unmarked. Setigerous tubercles minute. Head white with pale green submedian arcs and reticulation.

Described from five larvae collected at Longmire, Wash., July 25, 1938, in a swamp. Two moths emerged in August, and were determined by Clarke.

*Distribution*.—United States: Washington. Canada: British Columbia.

*Food plant*.—A triangular-stemmed sedge.

### BALSA Wik.

#### BALSA TRISTRICELLA (Wik.)

Head 2.6 mm. broad. Body about 25 mm. long and 3 mm. broad at middle, tapering posteriorly; skin smooth; general color green.

Green with white lines but the markings almost completely removed by the preservative. Spiracles white with brown rim. Prolegs on abdominal segments 3 and 4, and particularly on 3, conspicuously smaller than on 5 and 6, there being

about 12 crochets on each proleg on 3 and about 26 on 5. Head pavement-granulose, probably green, height of front much less than length of median line (22:34). Setigerous tubercles moderately large, somewhat elevated.

Described from eight alcoholic larvae collected near Chicago, Ill., July 30, 1943, by A. K. Wyatt.

*Distribution*.—Illinois, Pennsylvania, New Jersey, and New York; also Quebec, Canada.

*Food plant*.—Thornapple (*Crataegus*).

### ZOTHECA Grt.

#### ZOTHECA TRANQUILLA Grt.

Head 2.7 to 2.9 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin obscurely pavement-granulose; general color whitish marked with black, with conspicuous yellow stripes.

A broad middorsal yellow stripe broken into a uniform segmental series of spots margined with black on abdominal segments, the pattern different on thorax. From setigerous tubercle II to but not including III whitish flecked sparsely with black, with an indistinct white line ventrad of II, margined with black. Including III and extending to well ventrad of V a yellow stripe liturate with black. Spiracles black. Venter and prolegs green. Setigerous tubercles moderately large, flat, black. Legs black. Head granulose, black, unmarked.

Described from numerous larvae collected in Washington in May, June, and July. A moth emerged in August and was determined by Benjamin. The larvae rest in folded leaves tied with silk.

*Distribution*.—United States: California, Utah, Oregon, Idaho, and Washington. Canada: British Columbia and Alberta.

*Food plant*.—Elder (*Sambucus*).

### COSMIA Ochs.

#### COSMIA CANESCENS (Behr)

Head 2.8 to 3 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color olivaceous green closely flecked with yellowish both dorsally and ventrally.

A strong, continuous, yellowish white middorsal line, crossing the anal shield. Yellow line ventrad of setigerous tubercle II obscure. Spiracles pale brown with brown rim. Subventral stripe represented by a yellowish white line ventrad of the spiracles. Venter suffused with white midventrally. Setigerous tubercles of moderate size, scarcely elevated, white. Head deep green, sometimes with darker green reticulation.

Described from many larvae collected in Washington in May and June. Moths emerged in July and were determined by Heinrich.

*Distribution*.—United States: Texas, New Mexico, Arizona, California, Utah, Colorado, Washington, Nebraska, Illinois, Minnesota, Pennsylvania, Connecticut, Massachusetts, New York, and Maine. Canada: British Columbia.

*Food plant*.—Oak.

### ASEPTIS McD.

1. Mandible without a basal tooth or process (pl. 5, *I-N*). Anterior margin of labrum very broadly emarginate. Line  $P^1-P^1$  below apex of front..... 2
- Mandible with a basal tooth or process (pl. 5, *A-H*). Line  $P^1-P^1$  at or above apex of front..... 3

2. Emargination in anterior margin of labrum uniformly concave. Middorsal white line not constricted at the segmental incisures. Subdorsal white line ventrad of II parallel-sided. Head white, with hyaline freckles  
*characta*
- Emargination in anterior margin of labrum very obtusely angulate. Middorsal white line constricted at the incisures forming a segmental series of lanceolate figures. Subdorsal white line strongly sinuous on dorsal margin, straight on ventral margin. Head pallid greenish with black freckles posteriorly-----*monica*
3. Setigerous tubercle II<sup>p</sup> on mesothorax with a dark, sclerotized bar connecting the tubercle with the ventral muscle attachment (pl. 7, P). Head with dark pigment reticulation. General color of body dark gray-----*admixta*  
Setigerous tubercle II<sup>p</sup> on mesothorax without a visible sclerotized bar (pl. 7, O). General color of head and body green, without dark markings----- 4
4. Middorsal and subdorsal pale lines made up of pale flecks and seldom traceable. Subventral stripe yellow or tinged with yellow and not margined dorsally by a red line. Emargination in anterior margin of labrum very obtusely angulate (pl. 10, P)-----*fumeola*  
Middorsal and subdorsal pale lines distinct, usually continuous. Subventral stripe white with at least traces of a red or purplish bordering line dorsally. Emargination in anterior margin of labrum narrower (pl. 10, L)----- 5
5. With two slender pale lines originating at anterior margin of abdominal segments, one dorsally the other in the supraspiracular area, converging toward but not quite reaching the subdorsal line to form a segmental series of V-shaped figures which are broken at the angle-----*perfumosa*  
Without slender pale lines forming a segmental series of V-shaped markings  
*binotata*

#### ASEPTIS CHARACTA (Grt.)

Head 2.4 to 2.5 mm. broad. Body about 28 mm. long and 4 mm. broad at middle, tapering posteriorly; skin smooth; general color green.

Body green closely reticulate with white except as indicated. A narrow white middorsal stripe. A narrower white stripe just ventrad of setigerous tubercle II. Dorsal half of supraspiracular area sometimes paler than ventral portion. Spiracles white. White subventral stripe fading out ventrally. Venter of dorsal coloration, more whitish midventrally. Setigerous tubercles minute. Head white with peculiar hyaline freckles.

Described from numerous larvae collected in Washington in April and July. Moths emerged in May and August, and were determined by Benjamin.

*Distribution.*—United States: Arizona, California, Nevada, Utah, Colorado, Wyoming, Washington, and Montana. Canada: Alberta and British Columbia.

*Food plant.*—Sagebrush (*Artemisia*).

#### ASEPTIS MONICA (B. & McD.)

Head 2.5 mm. broad. Body about 28 mm. long and 4 mm. broad at middle, tapering posteriorly with a slight middorsal hump on abdominal segment 8; skin smooth; general color dark green with prominent white stripes.

Color uniform dark green except as indicated. A strong, continuous, narrow, middorsal white stripe constricted at juncture of segments forming a segmental series of lanceolate figures. A somewhat broader white stripe with setigerous tubercle II at dorsal margin, strongly sinuate dorsally and constricted at juncture of segments. Spiracles pale, in the subventral white stripe which may be obscure ventrad of the spiracles. Venter strongly reticulate with white. Setigerous tubercles minute. Head pallid greenish with black freckles at posterior margin.

Described from six larvae collected near Superior, Ariz., in March and April. Three moths emerged in May, and were determined by Clarke.

*Distribution*.—Arizona, Nevada, and California.

*Food plant*.—*Chrysoma (Haplopappus) laricifolia*, a low bushy composite with woody stems.

#### ASEPTIS ADNIXA (Grt.)

Head 2.3 to 2.4 mm. broad. Body about 28 mm. long and 4.5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color dark gray with dark subdorsal markings.

Coloration made up of black reticulation on a pale ground except as indicated. A strong white middorsal line and an obscure white line ventrad of setigerous tubercle 11, both margined by dark lines. A segmental series of black marks arising subdorsally on abdominal segments where they obliterate the subdorsal pale line, extending dorso-posteriorly between I and II to the middorsal line when fully developed, the combined pair of marks tending to outline a series of shield-shaped dorsal figures. A black line in the line of the spiracles produced ventrad including IV on 7. Spiracles white. Subventral pale stripe fading out ventrally. Venter of dilute dorsal coloration to base of prolegs, pale reticulate with white midventrally. Setigerous tubercles minute. Head brown with black submedian arcs and reticulation.

Described from many larvae collected about Puyallup, Wash., in April. Moths emerged in May and June, and were determined by Benjamin and by Clarke.

*Distribution*.—California, Washington, and British Columbia.

*Food plant*.—Indian-plum (*Osmaronia cerasiformis*).

#### ASEPTIS FUMEOLA (Hamp.)

Head 2.5 to 2.6 mm. broad. Body about 27 mm. long and 5 mm. broad at middle, tapering slightly posteriorly; skin smooth; general color green closely flecked throughout with sordid whitish.

Middorsal and subdorsal pale lines composed of pale flecks and seldom discernible. Spiracles white with brown rim. A narrow, sharply defined subventral stripe, yellow or yellowish white. Venter slightly paler than the dorsum. Setigerous tubercles minute. Head pale blue-green closely flecked with white, labrum and base of antenna yellow.

Described from 30 larvae collected on the road between Superior, Ariz., and Globe in April 1938. Two moths emerged June 12, 1938, and were determined by Clarke. A strange, sluggish larva, torpidity possibly due to narcotic property of food plant.

*Distribution*.—Arizona, California, and Utah.

*Food plant*.—Manzanita (*Arctostaphylos pungens*).

#### ASEPTIS PERFUMOSA (Hamp.)

Head 2.7 to 2.9 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color green.

Body dark green liturate with white throughout except as indicated. Strong, continuous white middorsal and subdorsal lines, the middorsal broad. Two slender pale lines originating at anterior margin of abdominal segments, one in the dorsal, the other in the spiracular area, converge toward the subdorsal line without meeting; forming a series of V-shaped figures broken at the angle. Spiracles white. Subventral white stripe fading out ventrally and margined dorsally by a purplish or red line. Setigerous tubercles minute. Head green reticulate with darker green.

Described from 25 larvae collected in eastern Washington in May and June. Moths emerged in July, and were determined by Clarke.

*Distribution.*—United States: California, Washington, and Montana. Canada: British Columbia.

*Food plant.*—Antelope-brush (*Kunzia tridentata*).

#### ASEPTIS BINOTATA (Wlk.)

Head 2.5 to 2.7 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color green, often with a whitish dorsal suffusion.

Dorsum to but not including the spiracles green flecked with white or yellowish except as indicated. A strong, continuous, white or yellowish middorsal line. A slender white or yellowish line well ventrad of setigerous tubercle II. Spiracles white. Subventral stripe reduced to a sharply defined white line margined dorsally by a red line which may appear on but a few segments. Venter green flecked with white. Setigerous tubercles minute. Head green, usually with darker green submedian arcs and reticulation.

Described from many larvae collected in Washington in April, May, and June. Moths emerged in May, June, and July, and were determined by Benjamin.

*Distribution.*—United States: California, Utah, Oregon, Idaho, Washington, and Montana. Canada: British Columbia.

*Food plants.*—Indian-plum (*Osmaronia*), snowberry (*Symphoricarpos*), and wild gooseberry (*Ribes*).

#### AMPHIPYRINAE, GROUP 5

1. Setigerous tubercle VII<sup>c</sup> present on abdominal segment 1 (pl. 4, D). The normally projecting portion of the spinneret entirely absent. Labrum not very broadly emarginate on anterior margin (pl. 10 L)----- 2  
Setigerous tubercle VII<sup>c</sup> absent on abdominal segment 1. The normally projecting portion of the spinneret present but reduced to a thin scalelike structure appressed to the labium----- 4
2. Venter of abdominal segment 10 free posteriorly (pl. 1, C, D). Body slender tapering decidedly posteriorly. Cutting edge of mandible with dorsal margin neither crenulate nor denticulate. Setigerous tubercles I and II inconspicuous but of small-to-moderate size----- *Ogdocoonta*  
Venter of abdominal segment 10 confluent with the subanal area (pl. 1, A, B). Body rather thick and, at most, tapering but slightly posteriorly. Cutting edge of mandible with dorsal margin usually either crenulate or denticulate. Setigerous tubercles I and II usually minute, mere setal insertions... 3
3. Postero-median setae on anal shield equidistant or farther from each other than from the postero-lateral setae (pl. 6, E). A large basal process normally present on oral face of mandible----- *Platysenta*  
Postero-median setae on anal shield much closer to each other than to the postero-lateral setae (10:15). No basal tooth or process on oral face of mandible----- *Leucozycta*
4. Without a callus between the femoral setae on mesothorax and metathorax. Labrum very broadly emarginate anteriorly. No dorsal hump on abdominal segment 8----- 5  
With a large callus partially between the femoral setae on mesothorax and metathorax----- 6
5. Setigerous tubercle II<sup>c</sup> on prothorax on the cervical shield (pl. 7 Q). Setigerous tubercle IV on abdominal segment 7 directly posterior to the spiracle, in the same position as on 6. Basal width of front much less than the height (28:40). Setigerous tubercle of moderate size, flat----- *Stibadium*  
Setigerous tubercle II<sup>c</sup> not on cervical shield (pl. 7, L). Setigerous tubercle IV on abdominal segment 7 far postero-ventrad of the spiracle, much lower than on 6. Basal width and height of front approximately equal. Setigerous tubercles large, convex----- *Plagiomimicus*

6. Basal width and height of front approximately equal (28:29). Cutting edge of mandible with 4 teeth and 2 or 3 denticles on dorsal margin. Tibiae not black. Setigerous tubercles moderately large, convex. Feeds on *Verbena* ..... *Crambodes*  
Basal width of front much greater than the height (50:43). Cutting edge of mandible with 5 large teeth. Tibiae black. Setigerous tubercles minute, mere setal insertions. .... 7
7. With a conspicuous subconical middorsal hump on abdominal segment 8. Labrum very broadly emarginate anteriorly (pl. 10, F) ..... *Cirrhophanus*  
Without a hump on abdominal segment 8. Labrum rather narrowly emarginate anteriorly. Feeds on *Verbesina* spp. .... *Basilodes*

## OGDOCONTA Butl.

## OGDOCONTA CINEREOLA (Gn.)

Head 1.9 mm. broad. Body about 25 mm. long and 3 mm. broad at middle, tapering posteriorly; skin smooth; general color green.

Body green flecked with white, dorsum usually suffused with white. Strong, sharply defined white lines middorsally and ventrad of II. Spiracles white, included in the subventral white stripe which may be margined dorsally by a purplish red line. Setigerous tubercles small to moderately large but not conspicuous, slightly elevated, white. Head greenish with white lines margining the front and faint traces of darker submedian arcs and lateral lines, labrum white.

Described from 12 larvae collected near Clarksville, Tenn., in August and September. Moths emerged in June of the following year, and were determined by Schaus.

*Distribution*.—Texas, Colorado, Kansas, Nebraska, Missouri, Illinois, Minnesota, Mississippi, Georgia, Tennessee, North Carolina, Virginia, Maryland, Pennsylvania, Massachusetts, and New York.

*Food plants*.—Ragweed (*Ambrosia artemisiaefolia*) and giant ragweed (*Ambrosia trifida*).

## PLATYSENTA Grt.

1. Without black stripes on head..... 2  
With two conspicuous black stripes on head..... 3
2. Head green with longitudinal white lines..... *discistriga*  
Head white with full black reticulation..... Species No. 29
3. Black stripes on head straight, slender, width of stripe at level of apex of front equal to approximately one-fifth the space between stripes at this point (8:38). Head reticulation red. Without a red line in line of spiracles..... *videns*  
Black stripes on head curved and much broader, width of stripe at level of apex of front equal to approximately half the space between stripes at this point (20:40)..... 4
4. Head reticulation red. Black stripes converging rather regularly to posterior margin of head. A red line in the line of the spiracles..... *vecora*  
Head reticulation black, sparse in *autor*. Black stripes not regularly convergent posteriorly..... 5
5. Black stripes on head not divergent posteriorly, enclosing a broom-shaped area. Without uniform dark reticulation, dorsally on body..... *autor*  
Black stripes on head convergent to a point above level of apex of front, then divergent posteriorly enclosing an hourglass-shaped area. With uniform dark reticulation dorsally on body..... *apameoides*

## PLATYSENTA DISCISTRIGA (Sm.)

Head 2.3 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color green with white lines.

Body bright green with many very small pale flecks both dorsally and ventrally except as indicated. A strong, continuous, bluish-white middorsal line.

A narrower white line ventrad of setigerous tubercle II and another well dorsad of III. Spiracles white, included in the subventral stripe on abdominal segments 5 and 6. Subventral stripe solid white, extending to V and including a pink median line. A white line along base of prolegs. Setigerous tubercles minute. Head green with a straight submedian white line arising above antennal insertion and extending to occiput; a white stripe mediad of the ocelli; two white lines posterior to the ocelli and a white stripe including ocellus VI.

Described from four larvae collected at Currant Flat east of the Cascade Mountains on Highway 410 in Washington, July 18, 1937. One moth emerged late in August and another early in September. These were determined by Clarke.

*Distribution.*—United States: New Mexico, Utah, Colorado, and Washington. Canada: British Columbia.

*Food plant.*—Rabbitbrush (*Chrysothamnus*).

#### PLATYSENTA sp. No. 29

Head 2.9 mm. broad. Body about 32 mm. long and 4.5 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color grayish brown.

Body peculiarly reticulate with whitish forming an arborescent pattern between setigerous tubercles I and II, the dark interstices tinged with purplish. Middorsal pale line broad but subdued, forming a small, conspicuous, elongate yellow spot with orange centre posteriorly on abdominal segment 8 and margined by a broad dark area. A definite blackish stripe dorsally in the suprspiracular area, margined by pale lines. Spiracles sordid pale, in the subventral pale stripe on 4, 5, and 6. Subventral stripe composed of reticulation with dorsal and ventral white lines and margined ventrally by a dark stripe extending to VI. Venter dark, covered closely by the peculiar pale reticulation. Setigerous tubercles minute. Head white with black reticulation.

Described from 11 larvae collected near Superior, Ariz., March 29, 1938. No moths were reared.

*Distribution.*—Arizona.

*Food plant.*—Desert broom (*Baccharis sarothroides*).

#### PLATYSENTA VIDENS (Gn.)

Head 2.2 to 2.3 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color probably green or pinkish.

Body of nearly uniform color flecked closely with small, rounded white spots both dorsally and ventrally except as indicated. A sharp, slender middorsal pale line. A less sharp and more slender pale line ventrad of setigerous tubercle II. An obscure pale line dorsad of III. Spiracles brown, in the subventral stripe on abdominal segments 4, 5, and 6. Subventral stripe strong, sharp, not reaching V, solid white excepting pinkish median markings. An indefinite pale stripe along outer bases of legs and prolegs. Setigerous tubercles minute. Head pale with two longitudinal red lines above front, sparse red reticulation, red stripes posterior to the ocelli and a slender black stripe arising above antennal insertion and extending to posterior margin of head.

Described from one inflated larva from the Brooklyn Museum received through the kindness of Geo. P. Engelhardt, and two alcoholic larvae from Clarksville, Tenn., collected in October 1931, by J. U. Gilmore and Joe Milam.

*Distribution.*—Colorado, Texas, Mississippi, Georgia, Florida, Kansas, Iowa, Missouri, Illinois, Minnesota, Kentucky, Tennessee, North Carolina, Maryland, Pennsylvania, Massachusetts, New York, and Maine.

*Food plants.*—Aster, goldenrod, and blossoms of other Compositae.

## PLATYSENTA VECORS (Gn.)

Head 2.6 to 2.8 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segment 8 slightly broadened; skin smooth; general color apparently green with a red longitudinal line at the spiracles.

Ground color of body closely flecked with white. A slender, broken white middorsal line margined with red particularly on thorax and anterior abdominal segments. Pale line ventrad of setigerous tubercle II obscure. A red line or narrow stripe including III, expanded dorsally including 8 posteriorly, 9 and the anal shield; the middorsal white line forming a large paler spot in the red area on 8. Spiracles brown or black, in the subventral white stripe on abdominal segments 4, 5, and 6. Setigerous tubercles minute, I beside a small red spot. Head probably green, a conspicuous black stripe arising above base of mandible and extending to posterior margin of head, two red stripes on front and sparse red reticulation posterior to the ocelli.

Described from four larvae from the U. S. National Museum as follows: 2 inflated larvae, both apparently from the Brooklyn Museum, and 2 alcoholic specimens, "Lettuce, Walton, Fla., 28 Dec., 1943, Lot 44-647, SS 7081, Link No. 16."

*Distribution.*—Texas, Colorado, Florida, Tennessee, Kentucky, Illinois, Minnesota, Maryland, New Jersey, Pennsylvania, Massachusetts, and New Hampshire.

*Food plants.*—Unknown. The above record for "lettuce" probably is abnormal.

## PLATYSENTA SUTOR (Gn.)

Head 2.7 mm. broad. Body about 30 mm. long and 5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color pale green overlaid with reddish to a very variable extent.

In some specimens the green is prominent with the reddish areas limited to a series of antiodorsal spots and small spots about the setigerous tubercles while in others the reddish may be disposed in a connected series of large middorsal spots and there may be diagonal reddish areas including tubercles I, II, and III. Middorsal pale line tending to form dots at anterior margin of some abdominal segments and forming a conspicuous white spot posteriorly on abdominal segment 8. Spiracles brown. Subventral stripe pale. Setigerous tubercles small, white. Head grayish white with two very broad black submedian stripes and sparse black reticulation.

Described from four larvae collected at Clarksville, Tenn., September 18, 1923, and one alcoholic larva collected at Oxford, N. C., September 1935, by J. U. Gilmore. Moths emerged in October, and were determined by Dyar.

*Distribution.*—United States: Kansas, Texas, Florida, North Carolina, Tennessee, Maryland, Pennsylvania, New Jersey, Massachusetts, New York, and Wisconsin. Canada: Ontario.

*Food plants.*—Larvae occur in damp spots supporting a rank growth of weeds, but their normal food plant is not known. They have been reported as causing damage to celery in Florida.

## PLATYSENTA APAMEOIDES (Gn.)

Head 2.1 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color probably either brown or gray.

Body to base of prolegs with rather uniform dark reticulation, the dorsum distinctly paler than the supraspiracular area. Strong pale lines middorsally and well ventrad of setigerous tubercle II, both margined by dark lines and forming conspicuous pale spots posteriorly on abdominal segment 8. Spiracles brown. A broad pale subventral stripe including all of the abdominal spiracles

(unless the spiracles were included in a red stripe which has faded out). Setigerous tubercles minute, encircled by a dark shade. Head pale with black submedian arcs and reticulation.

Described from one alcoholic larva from U. S. National Museum: "On *Bidens bipinnata*, Charleston, S. C., Sept. 17, 1943, Lot 44-102, SS No. 5995."

*Distribution*.—Texas, Mississippi, Florida, South Carolina, North Carolina, Tennessee, Kentucky, and Maryland.

*Food plant*.—*Bidens bipinnata*.

### LEUCONYCTA Hamp.

The writer is unable to indicate distinguishing characters for the two species of *Leuconycta* since they are similar structurally, and the coloration of *lepidula* has been completely removed by the preservative.

#### LEUCONYCTA LEPIDULA Grt.

Head 2.2 mm. broad. Body about 28 mm. long and 4 mm. broad at middle, tapering slightly posteriorly; skin smooth; general color probably green.

The markings have been completely removed by the preservative.

Described from four alcoholic larvae collected near Chicago, Ill., by A. K. Wyatt.

*Distribution*.—United States: Colorado, Minnesota, Missouri, Illinois, Ohio, Maryland, New Jersey, Pennsylvania, New York, Vermont, and Maine. Canada: Nova Scotia.

*Food plant*.—Dandelion (teste Wyatt).

#### LEUCONYCTA DIPHTEROIDES (Gn.)

Head 2.3 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, tapering slightly posteriorly; skin smooth; general color green.

A strong, nearly continuous white middorsal line. A more slender and broken white line slightly ventrad of setigerous tubercle II. A white stripe including the spiracles except on abdominal segment 8 and bordered dorsally by a purplish red stripe which may be absent on median abdominal segments. Spiracles white. Venter green. Setigerous tubercles minute. Head probably green and unmarked.

Described from one inflated larva from U. S. National Museum labeled "*Microcoelia diphteroides*, 18 days old, May 9, 1884, *Solidago*, 3415."

*Distribution*.—United States: Mississippi, Tennessee, North Carolina, Iowa, Illinois, Minnesota, Ohio, Pennsylvania, New Jersey, Maryland, Connecticut, Massachusetts, New York, and Maine. Canada: Quebec.

*Food plant*.—Goldenrod (*Solidago*).

### STIBADIUM Grt.

#### STIBADIUM SPUMOSUM Grt.

Head 3.5 mm. broad. Body about 23 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly; skin pavement-granulose; general color white tinged with brown dorsally.

Brownish dorsally to the spiracles, more intense in the area including setigerous tubercles I and II. Middorsal pale line narrower than that ventrad of II. Spiracles brown. Cervical shield and anal shield dark infuscated brown. Setigerous tubercles large, flat, black. Head a decided brown closely freckled with black.

Described from one alcoholic larva collected near Chicago, Ill., September 15, 1941, in flower head of *Helianthus annuus* by A. K. Wyatt.

*Distribution*.—California, Arizona, New Mexico, Texas, Utah, Colorado, Nebraska, Kansas, Iowa, Illinois, Minnesota, Missouri, and Pennsylvania.

*Food plant*.—Tunnels the flower heads of sunflowers (*Helianthus*), feeding on the seeds.

#### PLAGIOMIMICUS Grt.

Cervical shield pale brown with three pale lines. Skin set closely with small, somewhat isolated granules. Feeds on march elder (*Iva zanthifolia* Nutt.)

Cervical shield dark brown with broad lateral margins and a narrow posterior margin pale. Skin minutely, obscurely roughened, not granulose. Feeds on giant ragweed (*Ambrosia trifida*)----- *pityochromus*

#### PLAGIOMIMICUS EXPALLIDUS Grt.

Head 2.7 mm. broad. Body about 22 mm. long and 3 mm. broad at middle, tapering posteriorly; skin set closely with small somewhat isolated granules; general color indeterminable.

Dorsum to but not including setigerous tubercle II occupied by a band of dark reticulation more or less constricted at the incisures. An area including II and extending to III apparently pale with scarcely any dark markings. And area of dark reticulation including III, IV, and the spiracle. Spiracles brown. Setigerous tubercles large, somewhat elevated. Cervical shield pale brown with three pale lines. Head a decided brown freckled closely with black.

Described from 12 alcoholic larvae collected near Chicago, Ill., by A. K. Wyatt.

*Distribution*.—New Mexico, Arizona, Utah, Colorado, Montana, Kansas, Iowa, Illinois, and Minnesota.

*Food plant*.—Marsh elder (*Iva zanthifolia*) (teste Wyatt).

#### PLAGIOMIMICUS PITYOCHROMUS Grt.

Head 2.6 mm. broad. Body about 20 mm. long and 3.5 mm. broad at middle, tapering posteriorly; skin obscurely, minutely roughened, not granulose; general color not determinable.

Coloration apparently the same as that of *P. expallidus*, except that the cervical shield is dark brown with the broad lateral margins and narrow posterior margin pale, apparently white.

Described from four alcoholic larvae received from the U. S. National Museum: 1 specimen, "On *Ambrosia trifida*, seeds and seed capsules, Chicago, Ill., Sept. 5, 1934, A. K. Wyatt coll." and 3 larvae, "On *Ambrosia trifida*, Kinderhook, Ill., Sept. 18, 1933, L. C. Hack coll."

*Distribution*.—Texas, Mississippi, Colorado, Kansas, Nebraska, Iowa, Missouri, Illinois, Minnesota, Ohio, Pennsylvania, New Jersey, and New York.

*Food plant*.—Giant ragweed (*Ambrosia trifida*).

## CRAMBODES Gn.

## CRAMBODES TALIDIFORMIS Gn.

Head 2.3 mm. broad. Body about 25 mm. long and 3.5 mm. broad at middle, tapering distinctly posteriorly; skin smooth; general color green with a red line at the spiracles.

A middorsal white line margined with red, particularly near anterior margin of segments. A white line somewhat ventrad of setigerous tubercle II margined by a dark shade. A strong red line with III in dorsal margin margined ventrally by a narrow white stripe filled with red except at the margins. Spiracles brown, in white spots in the subventral stripe. Venter apparently pale. Setigerous tubercles of moderate size, somewhat elevated, pale. Head probably green with brown or black reticulation, mandible with 2 or 3 extra denticles on dorsal margin of cutting edge.

Described from one inflated and one alcoholic larva from U. S. National Museum: "*Crambodes talidiformis*, 2506, Dyar."

*Distribution*.—Arizona, Texas, Mississippi, Colorado, Kansas, Iowa, Illinois, Minnesota, North Carolina, Pennsylvania, New Jersey, and New York.

*Food plant*.—*Verbena*.

## CIRRHOPHANUS Grt.

## CIRRHOPHANUS TRIANGULIFER Grt.

Head 3.8 mm. broad. Body about 35 mm. long and 5.5 mm. broad at middle, tapering distinctly posteriorly with a pronounced, subconical dorsal hump on abdominal segment 8; skin smooth; general color not determinable.

Dorsum to the spiracles reticulate with fuscous or infuscated reddish except as indicated, more intense dorsally in a well-defined stripe margining the mid-dorsal pale stripe and extending to setigerous tubercle II. A pale line in the line of the spiracles divided anterior to the spiracle on abdominal segments, one branch extending obliquely down the proleg, and produced dorsally on abdominal segment 7 covering most of the dorsum of 8, where it is margined dorsally by a dark stripe. Including II and III a segmental series of oblique black spots most pronounced on first 3 abdominal segments and in a similar position on mesothorax and metathorax. Venter dark to base of prolegs. Color of spiracles not determinable. Tarsi black. Head white laterally streaked and freckled with black or brown; infuscated medially with black or brown freckles showing through the infuscation.

Described from 12 alcoholic or inflated larvae: (1) "Green Village, N. J., Sept. 20, Chas. Rummel coll.;" (1) "Magnolia, Tenn., Sept. 7, 1927"; and (10) "Kansas City, Mo., Sept. 21, 1941, on *Bidens trichosperma*, A. K. Wyatt coll."

*Distribution*.—Texas, Kansas, Missouri, Illinois, Tennessee, North Carolina, Virginia, Pennsylvania, New Jersey, and New York.

*Food plants*.—*Bidens* spp. known as beggar ticks or Spanish needle.

## BASILODES Gn.

The black lines margining the broken white subventral stripe slender and well defined throughout. Tarsi pale..... *chrysoptis*  
The dorsal one of the black lines margining the broken, white subventral stripe obscure, tending to be broadened to include the spiracles. Tarsi black... *pepita*

## BASILODES CHRYSOPIS Grt.

Head 3.4 to 3.5 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, tapering slightly posteriorly; skin smooth; dorsal coloration probably composed of orange and black transverse lines or stripes as in *pepita*, but the preservative has removed all but the black lines or stripes.

Markings in general very similar to those described for *pepita*. In *chrysois* the black lines margining the broken subventral stripe are both slender and well defined throughout while in *pepita* the margining dorsal black line is obscure and tends to be broadened to include the spiracle. In *chrysois* the tarsi are pale while in *pepita* they are black. Head with dark freckles, otherwise apparently unmarked.

Described from two alcoholic larvae from U. S. National Museum labeled as follows: "Brownsville, Tex., 18 Sept. 1939, Lot 39-15255, Brownsville, Tex., 33201, Assoc. with adult det. J. F. G. C."

*Distribution*.—Arizona, New Mexico, Texas, Colorado, and Kansas.

*Food plant*.—*Verbesina enceliodes*.

## BASILODES PEPITA Gn.

Head 3.3 to 3.6 mm. broad. Body about 32 mm. long and 5.5 mm. broad at middle, tapering slightly posteriorly; skin smooth; coloration of dorsum to the spiracles composed of transverse orange and black lines or stripes.

On mesothorax and metathorax the setigerous tubercles are in a broad orange stripe marginied by black lines. On each abdominal segment, except 9, 4 transverse black lines alternate with 3 orange lines, the anterior orange line expanded, forming a spot subdorsally; the black line dorsad of the spiracle often terminating subdorsally. Spiracles black. Subventral stripe conspicuous white, widely broken at the incisures forming a series of large white spots ventrad of the spiracles marginied by black lines, the dorsal obscure. Venter tinged with orange. Setigerous tubercles minute, in black spots when not in black lines. Cervical shield and anal shield orange. Tarsi black. Head brown apparently freckled with black.

Described from 3 inflated and 2 alcoholic larvae from the U. S. National Museum: 3 inflated "Chain Bridge, Md., IX.17.1912, *Verbesina alternifolia*, A. N. Caudell coll.," 2 alcoholic "Plummer's Is., Md., IX.23.1921, *Verbesina alternifolia*, G. P. Engelhardt coll."

*Distribution*.—Texas, Louisiana, Kansas, Tennessee, North Carolina, Illinois, West Virginia, Maryland, Pennsylvania, and New York.

*Food plant*.—*Verbesina alternifolia*.

## AMPHIPYRINAE, GROUP 6

This is a sharply defined group with a distinctive habitus, although it includes genera drawn from both the "Cucullinae" and the Amphipyrinae. All efforts to segregate a cuculline element and an amphipyrine element have been futile and the writer is inclined to believe that the group is homogeneous.

1. Height of prothoracic spiracle slightly less than that of spiracle on abdominal segment 1 (20:23). Seta III on abdominal segment 7 distinctly less than twice the spiracle height removed therefrom..... 6  
Height of prothoracic spiracle slightly greater than that of spiracle on abdominal segment 1 (18:17)..... 2
2. Seta III on abdominal segment 7 twice the spiracle height or more removed therefrom (23:10). Spinneret with a dorsal impressed line or groove. Skin minutely granulose..... 4  
Seta III on abdominal segment 7 distinctly less than twice the spiracle height removed therefrom. Skin smooth..... 3

3. Spinneret cylindro-conical without a dorsal impressed line or groove. Length of spinneret equal to five times the median width or more. Setigerous tubercles minute, mere setal insertions. Occipital angle a right angle. Middorsal pale line obscure or obsolete across the segmental series of shield-shaped dark markings----- *Sunira*  
Spinneret grooved dorsally, the length equal to approximately four times the median width. Setigerous tubercles large. Occipital angle decidedly acute----- *Hadeninae* with silk pore (*Lasiostra*, Genus No. 8)
4. Setigerous tubercle II<sup>b</sup> on mesothorax without a visible sclerotized bar connecting the tubercle with the ventral muscle attachment (pl. 7, O). Head freckled with black----- *Pseudanarta*  
Setigerous tubercle II<sup>b</sup> on mesothorax with a conspicuous sclerotized bar connecting the tubercle with the ventral muscle attachment (pl. 7, P). Head with black reticulation----- 5
5. Length of spinneret equal to 5 times the median width or more. Height of spiracle on abdominal segment 1 much less than that of the spiracle on 8 (12:21). Fleshy bases of labial palpi the width of the first segment apart (4:4). Skin granules very minute, not visible under a medium power of the binocular----- *Anorthodes*  
Length of spinneret equal to approximately four times the median width or less. Height of spiracle on abdominal segment 1 approaching distinctly closer to that of the spiracle on 8 (10:14). Fleshy bases of labial palpi twice the width of the first segment apart (8:4). Skin granules visible under a low power of the binocular----- *Proxenus*
6. Seta IV on abdominal segment 8 decidedly nearer to III than to V (25:34). Spinneret with a dorsal groove. Head nearly completely black, sometimes with black freckles visible----- *Platyperigea*  
Seta IV on abdominal segment 8 at most but slightly nearer to III than to V (25:27). Spinneret without a dorsal groove. Head not black, usually with black reticulation----- 7
7. Midventral muscle attachments arranged in a line between abdominal prolegs. Middorsal pale line nearly or quite absent except on thorax. No segmental series of dark, shield-shaped dorsal markings----- *Xanthia*  
Midventral muscle attachments usually forming a V-shaped or Y-shaped figure between abdominal prolegs (pl. 8, G). Broad middorsal pale line strong across the segmental series of dark, shield-shaped dorsal markings----- *Anathia*

## SUNIRA Franc.

1. Labial palpus approximately one-third as long as spinneret (11:37). Distribution limited to areas east of the Rocky Mountains----- *bicolorago*  
Labial palpus decidedly more than one-third as long as spinneret. Distribution limited to areas west of the Rocky Mountains----- 2
2. Labial palpus decidedly more than half as long as spinneret (20:33). Head pale brownish----- *verberata*  
Labial palpus somewhat less than one-half as long as spinneret (14:34). Head a decided brown----- *straminea*

## SUNIRA BICOLORAGO (Gn.)

Head 1.7 to 2 mm. broad. Body about 27 mm. long and 4 mm. broad at middle, broadening posteriorly; skin smooth; general color dark brownish flecked with white and tinged with purplish.

Middorsal and subdorsal pale lines obscure, the middorsal line obsolete across the dorsal dark figures. A segmental series of dark shield-shaped dorsal figures on abdominal segments. Supraspiracular area uniformly dark. Spiracles black. Subventral pale stripe represented by a line, more distinct and yellowish anteriorly. Venter of dilute dorsal coloration. Setigerous tubercles minute. Head deep brown with black submedian arcs and reticulation, sometimes nearly completely infuscated.

Described from many larvae collected about Clarksville, Tenn., in April and May. These estivate, the moths emerging in September

and October. Moths determined by Dyar. Crumb (19) gives an account of this species with figures.

*Distribution.*—United States: Nebraska, Kansas, Texas, Iowa, Minnesota, Illinois, Tennessee, North Carolina, Virginia, Maryland, Pennsylvania, New Jersey, Massachusetts, New York, New Hampshire, and Maine. Canada: New Brunswick, Ontario, and Manitoba.

*Food plants.*—Tobacco, dock (*Rumex crispus*), maple, and cabbage.

#### SUNIRA VERBERATA (Sm.)

Head 2.5 mm. broad. Body about 27 mm. long and 4 mm. broad at middle, broadening posteriorly; skin smooth; general color dark with a series of shield-shaped dorsal figures and sometimes tinged with purplish.

Middorsal and subdorsal pale lines but faintly indicated, the middorsal line obsolete on the dark dorsal figures. A segmental series of dark, shield-shaped dorsal figures on the abdomen, sometimes more evident posteriorly. Supraspiracular area uniformly blackish to and including the spiracles. Spiracles black. Subventral pale stripe scarcely indicated except on thorax. Venter pale, obscurely marked with blackish and white. Setigerous tubercles minute. Head pale brownish, unmarked or with black submedian arcs and reticulation.

Described from 12 larvae collected at Easton, Westport, and Alderton, Wash., in April and June. Moths emerged in July and August, and were determined by Benjamir and by Clarke.

*Distribution.*—United States: New Mexico, California, Utah, Oregon, Idaho, Montana, and Washington. Canada: British Columbia and Alberta.

*Food plants.*—Willow is the preferred food plant, but larvae occur on snowberry (*Symphoricarpos*) and strawberry.

#### SUNIRA STRAMINEA (Sm.)

Head 2.1 mm. broad. Body about 27 mm. long and 3.5 mm. broad at middle, broadening posteriorly; skin smooth; general color light gray with a series of dark dorsal figures.

The slender, broken middorsal pale line obsolete across the dark dorsal figures. A segmental series of dark shield-shaped dorsal figures on the abdomen; margined ventrally by the obscure subdorsal pale line. Dorsal half of supraspiracular area paler than ventral half, margined ventrally by a pale line near III. Spiracles black. Subventral pale stripe fading out ventrally, tinged somewhat with yellow and orange. Venter pale reticulate with white. Setigerous tubercles minute. Head a decided brown, submedian arcs represented by a dark shade along margin of front, sparse dark reticulation posteriorly.

Described from 5 larvae: 2 collected near Pullman, Wash., May 16, 1933, on chokecherry by J. F. Gates Clarke, and 3 larvae collected near Ellensburg, Wash., May 21, 1933, on chokecherry by the writer. Moths emerged in August and September, and were determined by Benjamin.

*Distribution.*—Utah and Washington.

*Food plant.*—Chokecherry (*Prunus demissa*).

#### PSEUDANARTA Grt.

##### PSEUDANARTA FLAVA (Grt.) (or n. sp.)

Head 1.9 mm. broad. Body about 25 mm. long and 4.5 mm. broad at middle, broadened posteriorly; skin bearing minute, obscure somewhat isolated granules; general color moderately light gray sometimes tinged with brown.

Middorsal pale line broken, faint, obliterated by a small black spot at anterior margin of abdominal segments. Dorsal area including setigerous tubercle II dis-

tinctly paler than the supraspiracular area, including a rather obscure segmental series of connected rhomboidal figures usually more distinct on posterior segments. Spiracles brown, each in a pale area. A distinct but not sharply defined whitish subventral stripe. Venter dark throughout, less so midventrally. Setigerous tubercles minute. Head pale with black freckles overlaid more or less by infuscation, sometimes wholly dark.

Described from 20 larvae collected under cow chips in a pasture at Asotin, Wash., April 3, 1935, by Joseph Wilcox and the writer. The larvae remained unchanged in silken cells in the soil until about the middle of July. Moths emerged in August and September, and were determined by Heinrich as either *flava* or a new species. Moths in U. S. National Museum.

*Distribution of flava.*—United States: New Mexico, Colorado, Utah, Nevada, Montana and Washington. Canada: British Columbia.

*Food plant.*—Grass.

### ANORTHODES Sm.

#### ANORTHODES TARDA (Gr.)

Head 1.8 mm. broad. Body about 22 mm. long and 4 mm. broad at middle, abdominal segments 7 and 8 abruptly broadened; skin and cervical shield bearing very minute dark granules; general color the soft brown of dead oak leaves.

A pale middorsal line, a pale transverse dorsal line on posterior extremity of abdominal segment 8 including 4 small black spots, a dark stripe on 9 just ventrad of setigerous tubercle I and a segmental series of obscure dark V-shaped dorsal figures, more intense at their middorsal apices at posterior margin of abdominal segments. Spiracles brown. No subventral pale stripe. A black stripe on each proleg. Setigerous tubercles minute. Head brown with black submedian arcs and black to ferruginous reticulation.

Described from 13 larvae collected near Ringold, Tenn., February 3, 1927, by J. U. Gilmore and the writer, at which time some of the larvae were mature. The larva is able to flatten the margins of the body and clings closely to the dead leaf upon which it rests. Moths emerged in March and were determined by Dyar.

*Distribution.*—Texas, Florida, Tennessee, North Carolina, Missouri, Illinois, Indiana, West Virginia, Maryland, Pennsylvania, New Jersey, New York, and New Hampshire.

*Food plant.*—Dead oak leaves.

### PROXENUS H.-S.

#### PROXENUS MIRANDA (Gr.)

Head 1.7 mm. broad. Body about 25 mm. long and 3.5 mm. broad at middle, broadening posteriorly; skin bearing very small, isolated, pointed granules; general color dusky gray.

Dorsum to well ventrad of setigerous tubercle II paler than the supraspiracular area, reticulate with blackish, except in the line of II, without a segmental series of middorsal dark figures. Supraspiracular area blackish, the color more intense at dorsal and ventral margins. Spiracles black, in the ventral coloration. Subventral pale stripe scarcely indicated. Venter pale reticulate throughout with blackish. Setigerous tubercles minute. Head smooth, brown, with dilute blackish submedian arcs and sparse reticulation.

Described from five larvae collected in Washington in September, October, and March. A moth emerged May 12, 1935, and was determined by Clarke.

*Distribution*.—Colorado, Arizona, Utah, California, Washington, North Dakota, Nebraska, Iowa, Kansas, Missouri, Illinois, Indiana, Minnesota, Pennsylvania, New Jersey, Connecticut, New York, Maine, and the adjacent Provinces of Canada.

*Food plants*.—Under matted alfalfa.

### PLATYPERIGEA Sm.

1. Setigerous tubercles moderately large, flat, black. General color light gray to dark gray.-----*extima*  
Setigerous tubercles minute, mere setal insertions. General color blackish  
*mona* B. & McD.

#### PLATYPERIGEA EXTIMA (Wlk.)

Head 1.8 mm. broad. Body about 25 mm. long and 3.5 mm. broad at middle, broadening posteriorly; skin smooth; general color light gray to dark gray.

Dorsum paler than the supraspiracular area. Middorsal pale line obscure. Supraspiracular area darkest dorsally, the dark color gradually more dilute to ventrad of the spiracles. Spiracles black. No subventral pale stripe. Venter much flecked with white. Setigerous tubercles moderately large, flat, black. Head deep brown overlaid by infuscation, black freckles sometimes visible.

Described from 15 larvae collected near Yakima, Wash., April 18, 1930, by C. W. Getzendaner and the writer. Moths emerged in May, and were determined by Heinrich.

*Distribution*.—United States: New Mexico, Arizona, California, Nevada, Utah, Colorado, Kansas, Oregon, Idaho, Montana, North Dakota, Washington, Pennsylvania, and New York. Canada: Manitoba, Alberta, and British Columbia.

*Food plants*.—Alfalfa and mullein (*Verbascum thapsus*).

#### PLATYPERIGEA MONA (B. & McD.)

Head 1.9 mm. broad. Body about 20 mm. long and 3.5 mm. broad at middle, abdominal segments 7 and 8 somewhat broadened; skin smooth; general color blackish.

Dorsum slightly paler than the supraspiracular area and tinged faintly with brown. A broken middorsal pale line more distinct on posterior half of abdominal segments. An obscure segmental series of dark rhomoidal figures on abdomen. Subdorsal pale line obscure. Spiracles black. No subventral pale stripe. Venter to base of prolegs of dilute dorsal coloration, sordid pale midventrally. Setigerous tubercles minute. Head entirely black.

Described from four larvae collected in eastern Washington in May. A moth (No. 419 in U. S. National Museum) emerged August 30, 1936, and was determined by Clarke as "near *meralis* but probably distinct." The specimen is now placed under *mona* in the museum collection.

*Distribution*.—California and Washington.

*Food plant*.—Unknown, but apparently dead leaves.

### XANTHIA Ochs.

#### XANTHIA LUTEA (Strom.)

Head 2.1 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, broadening posteriorly; skin smooth; general color blackish tinged with purplish.

Middorsal pale line absent except on thorax, a small, dark middorsal spot at anterior margin of abdominal segments. Subdorsal pale stripe inconspicuous. No segmental series of dark shield-shaped dorsal figures. Dorsal half of supra-

spiracular area paler than ventral half, margined ventrally by a pale line including setigerous tubercle III. Spiracles black. No subventral pale stripe. Venter paler than dorsum and tinged with purplish. Setigerous tubercles minute. Head pale brown with strong black submedian arcs and reticulation, a black area above antennal insertion.

Described from numerous larvae collected at Westport, Wash., in May by Wm. W. Baker and the writer, and two alcoholic larvae collected at Fremont, Ind., May 13, 1935, by A. K. Wyatt.

*Distribution.*—Washington, Colorado, Minnesota, Indiana, Pennsylvania, New York, New Hampshire, Maine, and the adjacent Provinces of Canada.

*Food plant.*—Willow, preferring the catkins.

#### ANATHIX Franc.

The larvae of *aggressa* are somewhat larger than those of *puta*, with head of mature larva 2.2 mm. broad and body 4 mm. broad in *aggressa* as compared with 1.8 and 3.5, respectively, for *puta*. Otherwise the larvae seem to be very similar.

#### ANATHIX AGGRESSA (Sm.)

Head 2.1 to 2.2 mm. broad. Body about 25 mm. long and 4.5 mm. broad at middle, broadening gradually to abdominal segment 8; skin smooth; general color probably dark gray.

A segmental series of dark shield-shaped dorsal figures divided by the broad middorsal pale line. Remainder of dorsum to and including the spiracles of a similar shade but less intense. Spiracles dark brown. Venter pale. Setigerous tubercles minute. Head pale brown overlaid with black on anterior one-third, very sparsely reticulate with black posteriorly.

Described from three alcoholic larva collected near Chicago, Ill., May 23, 1939, by A. K. Wyatt.

*Distribution.*—United States: Illinois, Iowa, Kansas, Colorado, New Mexico, Utah, Idaho, and Montana. Canada: Alberta.

*Food plant.*—Poplar, preferring the catkins (teste Wyatt).

#### ANATHIX PUTA (G. & R.)

Head 1.8 mm. broad. Body about 25 mm. long and 3.5 mm. broad at middle, broadening posteriorly; skin smooth; general color dark tinged with purplish.

A segmental series of dark shield-shaped dorsal figures present throughout on the abdomen or on segments 7 and 8 only, cut by the broad, yellowish middorsal line. An inconspicuous broken pale line well ventrad of setigerous tubercle II. Supraspiracular area paler than the dorsal area, much reticulate with white. Spiracles dark brown. No subventral pale stripe. Venter pale flecked with white. Setigerous tubercles minute. Head brown with black submedian arcs and reticulation; front, adfrontal areas and a large spot above antennal insertion black.

Described from many larvae collected in eastern Washington in April, May, and June. Moths emerged in June, and were determined by Benjamin.

*Distribution.*—Washington, Montana, Utah, Colorado, New Mexico, Wisconsin, Minnesota, Connecticut, New York, Maine, and the adjacent Provinces of Canada.

*Food plant.*—Poplar, larvae on damp soil beneath the trees.

## AMPHIPYRINAE, GROUP 7

1. Ocelli III and IV not more than one-half the width of III apart. Setigerous tubercle II<sup>b</sup> on mesothorax normally with a dark sclerotized bar contrasting in color with adjacent parts and connecting the tubercle with the adjacent ventral muscle attachment (pl. 7, P). Larvae seldom green..... 2  
*Ocelli III and IV more than half the width of III apart except in Aseptis monica. Setigerous tubercle II<sup>b</sup> on mesothorax without a visible ventral bar (pl. 7, O). Larvae green except black with pale lines in Phosphila turbulenta..... 8*
2. Third segment of labial palpus not more than one-half as long as the basal segment. Length of spinneret equal to more than twice the median width. 3  
 Third segment of labial palpus more than one-half as long as basal segment, the two usually subequal in length..... 5
3. Spinneret cylindro-conical. Mandible with about 12 teeth on cutting margin. Ocellus VI approximately twice as near to V as to IV (7:13). Crochets on prolegs obscurely biordinal (pl. 6, H)..... *Callopiatria*  
 Spinneret flattened and grooved dorsally. Mandible with 4 or 5 teeth on cutting margin. Ocellus VI nearly or quite equidistant between ocelli V and IV. Crochets on prolegs uniordinal (pl. 6, G)..... 4
4. Transverse line of setae P<sup>1</sup> above apex of front. Body decidedly broadened on thorax and first two abdominal segments..... *Blaphria*  
 Transverse line of setae P<sup>1</sup> below apex of front. Body not broadened on thorax and first two abdominal segments..... *Nedra (Delta)*
5. Seta O' on or anterior to a line which would connect the centres of ocelli IV and VI. Spinneret broad and flat with a middorsal groove (pl. 3, G), the length seldom equal to twice the median width..... 7  
 Seta O' posterior to a line which would connect the centers of ocelli IV and VI. Length of spinneret equal to more than twice the median width. 6
6. Spinneret cylindro-conical, at most with a slender, impressed middorsal line. Head with dark reticulation. Hind coxae touching. Setigerous tubercles minute, mere setal insertions. Body not broadened on abdominal segment 8..... *Lycanades*  
 Spinneret usually flattened and grooved dorsally. Head with black or brown freckles except in Genus No. 7. Hind coxae often well separated. Setigerous tubercles usually moderately large. Body often broadened on abdominal segment 8..... *Hadeninae* with open apical silk pore
7. Midventral muscle attachments between the abdominal prolegs forming a line. Black subdorsal markings on abdominal segment 8 broadest about midway of their length, but these markings obsolescent in *praefica*.  
*Prodenia*  
 Midventral muscle attachments between the abdominal prolegs forming a Y with the arms at anterior end (pl. 8, G). Black subdorsal markings on abdominal segment 8 of a different character..... *Laphygma*
8. Two of the apical, ventral setae on tarsus broadly flattened, spatulate. Mandible with dorsal edge of cutting margin crenulate or denticulate. Setae P<sup>1</sup> on head decidedly farther apart than setae P<sup>2</sup> (44:34). Labrum with emargination in anterior margin comparatively narrow..... *Phosphila*  
 All apical setae on tarsus normal, setiform. Setae P<sup>1</sup> on head, at most, but slightly farther apart than setae P<sup>2</sup> (40:38)..... 9
9. Labrum very broadly emarginate on anterior margin (pl. 10, F)..... 10  
 Labrum of the usual form, with emargination in anterior margin comparatively narrow (pl. 10, L)..... 11
10. Transverse line of setae P<sup>1</sup> above apex of front. Feed exclusively on coniferous trees..... *Achytonia*  
 Transverse line of setae P<sup>1</sup> below apex of front. Do not feed on trees.  
*Aseptis* in part
11. Height of prothoracic spiracle much greater than that of the spiracle on abdominal segment 1 (23:15)..... *Eremobina*  
 Height of prothoracic spiracle but little greater than that of spiracle on abdominal segment 1 (23:21)..... 12
12. Setigerous tubercle IV on abdominal segment 2 twice the spiracle width removed therefrom. Subventral pale stripe extending around margin of anal shield..... *Amphipyra*  
 Setigerous tubercle IV on abdominal segment 2 three times the spiracle width, or more, removed therefrom. Subventral pale stripe extending down anal proleg, as usual..... *Catabena*

## CALLOPISTRIA Hbn.

## CALLOPISTRIA FLORIDENSIS (Gn.)

Head 2.1 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, abdominal segments of about equal width to 8; skin smooth; general color blackish.

Two sinuous pale lines middorsally and another ventrad of II. A pale area between setigerous tubercle III and the spiracles. A dark line or narrow stripe including the spiracles. Spiracles pale. A band composed of pale lines and flecks with V at center. Venter dark. Setigerous tubercles rather large, flat, black, encircled by a pale line. Head brown with dark submedian arcs and reticulation.

Described from one alcoholic larvae taken in a greenhouse at San Leandro, Calif., January 24, 1933, and submitted by H. H. Keiffer, and one alcoholic larva taken in a greenhouse in March 1936, at Oregon City, Oreg., and submitted by W. D. Edwards. These larvae have been found in greenhouses in numerous places as far north as Canada, having been introduced on ferns from the south.

*Distribution.*—Texas, Louisiana, and Florida.

*Food plant.*—Ferns.

## ELAPHRIA Hbn.

A distinct subconical, dorsal hump on abdominal segment 8. Middorsal line segmentally expanded, forming a series of conspicuous broadly triangular or wing-shaped white spots.----- *versicolor*  
No dorsal hump on abdominal segment 8. Middorsal line strong, scarcely segmentally broadened, associated with a group of pale flecks medially on some abdominal segments.----- *grata*

## ELAPHRIA VERSICOLOR (Grl.)

Head 1.6 mm. broad. Body about 16 mm. long and 2.5 mm. broad at middle, broadened on metathorax and abdominal segments 1 and 2 and probably slightly broadened on 7 and 8; with a very decided middorsal hump on 8; skin smooth; general color brownish.

Coloration to base of prolegs composed of dark, obscure reticulation except as indicated. White middorsal line inconspicuous on thorax, expanded on abdominal segment 1 forming a conspicuous transverse mark and forming broadly triangular marks on 3 to 6 expanded subdorsally on 4, becoming inconspicuous dorsally on 7 and 8 and produced laterally on 8 forming a conspicuous subdorsal spot extending upon 9. Dark spots including I on 1 and ventrad of I on 2. A dark line dorsad of the spiracles, broadened posteriorly. Spiracles black. Subventral pale stripe filled with dark reticulation except at margins, including the spiracles. Midventer of dilute dorsal coloration. Setigerous tubercles minute. Head brown, adfrontal areas, margin next the median line, a broad stripe arising above antennal insertion and curving dorso-laterally to posterior margin and an indefinite stripe posterior to the ocelli, black.

Described from five alcoholic larvae labeled "St. Jovite, P. Q., F. I. Survey, 28.VII. 37." These were received through the kindness of Mr. A. W. A. Brown, of the Canadian Division of Entomology.

*Distribution.*—United States: Pennsylvania, Massachusetts, New York, New Hampshire, and Maine. Canada: Nova Scotia and Quebec.

*Food plant.*—Spruce.

## ELAPHRIA GRATA Hbn.

Head 1.7 mm. broad. Body about 20 mm. long and 3.5 mm. broad at middle, broadened on thorax and abdominal segments 1, 2, 7 and 8; skin smooth; general color dark brown to dark gray.

Middorsal pale line associated with a group of pale flecks forming a pale spot at middle of abdominal segments. A conspicuous pale spot subdorsally on abdominal segment 1. A black spot subdorsally on 2. A pale transverse line enlarged on its ventral apices posteriorly on dorsum of 8. Dorsal half of supraspiracular area paler than ventral portion. Spiracles black. Subventral stripe composed of pale flecks and including a series of orange spots. Venter rather dark much flecked with white. Setigerous tubercles minute. Legs black. The pale ground color of head concealed by black except along the adfrontal areas and in a stripe at the ocelli.

Described from 12 larvae collected about Clarksville, Tenn., in February, June, and November. A larva collected February 3, 1927, pupated February 12 and the moth emerged March 4. Dyar determined moths.

*Distribution.*—Texas, Mississippi, Florida, Kansas, Missouri, Illinois, Ohio, Tennessee, North Carolina, Virginia, Maryland, Pennsylvania, New Jersey, and New York.

*Food plants.*—Taken under plant debris about chickweed (*Stellaria*), clover, and various other low plants, and has been reared on dead forest leaves.

### NEDRA Clarke

(*Delia* auct., nec Saalm.)

Distribution limited to areas east of the Rocky Mountains..... *ramosula*  
 Distribution limited to the Pacific coast..... *stewarti*

### NEDRA RAMOSULA (Gr.) (DELTA)

Head 2.1 mm. broad. Body about 37 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin smooth; general color dark brown both dorsally and ventrally.

Broken pale lines present middorsally, subdorsally and dorsad of setigerous tubercle III. Spiracles black, in the darker dorsal coloration. A strong, sharply defined ivory white or yellowish subventral stripe bordered dorsally and ventrally with blackish, the ventral dark border fading out ventrally. Setigerous tubercles minute. Head pale with submedian arcs, reticulation, front and all segments of the antennae red, a white band including ocellus VI.

Described from one alcoholic larva collected near Clarksville, Tenn., October 26, 1923. No moth was reared, the determination being based on the similarity of this larva to that of *stewarti*.

*Distribution.*—United States: Florida, Georgia, Mississippi, Louisiana, North Carolina, Tennessee, Kentucky, Arkansas, Missouri, Illinois, Kansas, Maryland, New Jersey, Pennsylvania, Connecticut, Massachusetts, New York, and Maine. Canada: New Brunswick, Nova Scotia, and Ontario.

*Food plant.*—Said to feed on St. Johnswort (*Hypericum*).

### NEDRA STEWARTI (Gr.) (DELTA)

Head 2 to 2.1 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color varying through shades of brown to a soft dark gray.

A narrow middorsal stripe scarcely paler than adjacent parts and margined by slender dark lines. Traces of a broken pale line including setigerous tubercle I. An indefinite pale stripe with II at centre. A pale stripe well ventrad of II margined by dark lines. A pale line dorsad of III. Remainder of supraspiracular area reticulate with purplish and with a dark line including the spiracles. Spiracles gray. A strong, white subventral stripe including V on some segments.

Venter of dorsal coloration gradually diluted to white midventrally. Setigerous tubercles minute. Head pale brownish with bright red submedian arcs and reticulation, the reticulation sparse laterally except posterior to the ocelli.

Described from many larvae collected on the gravelly prairie about Parkland, Wash., from early in June to the middle of July. Moths emerged in June and July, and were determined by Benjamin.

*Distribution.*—California, Oregon, and Washington.

*Food plant.*—Klamath weed (*Hypericum perforatum*).

### PRODENIA Gn.

1. Head markings a bright brown, no black except sometimes in a spot opposite base of front. Adfrontal areas pale brown..... *eridania*  
Head markings black. Adfrontal areas conspicuous white..... 2
2. Head with conspicuous black submedian arcs but remainder of posterior half of head conspicuously reticulate (pl. 8, J)..... *praefica*  
Head with submedian arcs indefinite, represented by a broad black area. Posterior half of head mostly black or infuscated, reticulation usually visible at lateral margin only (pl. 8, K)..... 3
3. Subdorsal black spots on mesothorax absent or much smaller than those on abdominal segment 8..... *ornithogalli*  
Subdorsal black spots on mesothorax nearly or quite as large as those on abdominal segment 8..... *dothchos*

### PRODENIA ERIDANIA (Cram.)

Head 2.6 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, abdominal segment 8 somewhat broadened; skin smooth; general color a deep uniform gray, sometimes tinged with olivaceous or pinkish.

Middorsal line, subdorsal stripe and subventral stripe whitish tinged with orange or pinkish, the subventral stripe much the broader. Laterally on the dorsum a segmental series of black triangles angulate dorsally which may appear on every segment but the prothorax or may be absent except on posterior abdominal segments. Lower half of supraspiracular area darker than dorsal half. Spiracles brown. Venter suffused with pinkish or orange and much flecked with white. Setigerous tubercles minute. Head pale yellow overlaid heavily with bright reddish brown reticulation, more or less fused forming reddish brown areas, no black except occasionally in a small area beside the base of the front.

Described from many larvae collected at Clarksville, Tenn. In the more southern States, 4 or 5 broods are produced during the year. Chittenden and Russell (8) furnish an extensive, illustrated account of this species, and a briefer illustrated account has been published by Crumb (19).

*Distribution.*—Virginia, North Carolina, Tennessee, Georgia, Florida, Louisiana, Texas, New Mexico, and southward into South America.

*Food plants.*—A very general feeder, preferring careless weed (*Amaranthus spinosus*) and pokeweed (*Phytolacca decandra*).

### PRODENIA PRAEFICA Grt.

Head 3.3 to 3.5 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, broadened on metathorax and abdominal segments 1, 2, 7, and 8; skin smooth; general color dark in the specimens at hand.

In the following description lines or stripes which may have been white, yellow, orange, or pinkish have been reduced to a uniform whitish by the preservative; all are described as "pale." Middorsal pale line obscure. Dorsum to and including setigerous tubercle II black with pale longitudinal strands and lines, the black spots anterior to II obscure, linear except somewhat better developed on abdominal segment 8. A pale stripe ventrad of II. Supraspiracu-

lar area divided medially by a longitudinal pale line, ventral portion dark with obscure pale markings, including the spiracles, dorsal portion much paler including broken pale lines. Spiracles brown. A sinuous subventral pale stripe extending to but not including V. Venter apparently with dark reticulation, more dilute midventrally. Setigerous tubercles minute. Head brown with black submedian arcs and reticulation, a large black area above antennal insertion, adfronted areas white, front black.

Described from 25 alcoholic larvae collected near Sacramento, Calif., August 10, 1925, from alfalfa by C. C. Wilson. Blanchard (4) has published an account of this species.

*Distribution.*—California, Nevada, and Utah.

*Food plants.*—Cotton, alfalfa, watermelon, grape, peach, and numerous other plants.

#### PRODENIA ORNITHOGALLI Gn.

Head 2.8 to 3 mm broad. Body about 35 mm. long and 6 mm. broad at middle, broadened somewhat on metathorax and abdominal segments 1, 2, 7, and 8; skin smooth; general color varying from pale gray to jet black.

In well-marked individuals the dorsal coloration is made up of dark strands on a pale ground except as indicated; the subtriangular black subdorsal markings, which are broadest about midway of their length, may be conspicuous on all segments but the prothorax or may be obsolete except on abdominal segment 8; there may be a bright yellow stripe ventrad of the black subdorsal triangles or this may be absent; there is usually a distinct dark band including the spiracles and a subventral white stripe which may be more or less suffused with orange or pinkish. Spiracles brownish. Setigerous tubercles minute. Head brown overlaid and all but concealed dorsally by black, adfrontal areas conspicuous white.

Described from many larvae from various sources. In northern Tennessee there are 4 broods per year. Crumb (19) gives an account of this species with figures.

*Distribution.*—Occurs generally east of the Rocky Mountains, in New Mexico, Utah, and California west of the mountains and southward into Mexico and the West Indies. Most common south of the latitude of the Ohio River.

*Food plants.*—A very general feeder.

#### PRODENIA DOLICHOS (F.)

Head 3.1 to 3.3 mm. broad. Body about 35 to 43 mm. long and 6 to 8 mm. broad at middle, broadened somewhat on the metathorax and abdominal segments 1, 2, 7, and 8; skin smooth; general color varying from very light gray to very dark gray, usually a soft light gray.

Middorsal line orange, usually obscure. A segmental series of indefinite diamond-shaped dorsal figures on the abdomen, connected at their lateral angles with a series of black spots broadest about midway of their length, the spots on mesothorax nearly or quite as large as those on abdominal segment 8. Subdorsally, ventrad of the black spots, an orange stripe, yellow dorsally. Supraspiracular area of dorsal color darker ventrally, with a broken median yellow line and forming a dark spot on abdominal segment 1. Spiracles brown. A sinuous orange subventral stripe margined ventrally by a similar stripe composed of white flecks. Venter dull brownish flecked with white. Setigerous tubercles minute. Head brown overlaid and nearly concealed by black, adfrontal areas white.

Described from numerous larvae collected about Clarksville, Tenn., where there are several broods per year. Crumb (19) has published an illustrated account of this species.

*Distribution*.—New York, Massachusetts, New Jersey, Pennsylvania, Illinois, Kentucky, Maryland, Tennessee, North Carolina, Texas, Mississippi, Alabama, Georgia, Florida, and southward into Central America and the West Indies.

*Food plants*.—Tobacco, *Physalis*, *Nicandra physalodes*, tomato, turnip, Jimsonweed (*Datura*), asparagus, violet, *Commelina communis*, ground pea, sweetpotato, cotton, raspberry, and grass.

### LAPHYGMA Gn.

Skin pavement granulose. Setigerous tubercles rather large. Line P<sup>1</sup>-P<sup>1</sup> above apex of front

Skin smooth. Setigerous tubercles minute. Line P<sup>1</sup>-P<sup>1</sup> below apex of front

### LAPHYGMA FRUGIPERDA A. & S.

Head 2.6 to 2.8 mm. broad. Body about 30 mm. long and 4.5 mm. broad, abdominal segments of about equal width to 8; skin bearing very small, round, convex granules; general color varying from pinkish through yellowish, olivaceous and dull gray to almost black. The darker phase is described below.

Dorsum paler than the supraspiracular area, overlaid with strands and flecks of brownish or blackish. Middorsal line broad, subdued but sharply defined. A strong yellowish line ventrad of setigerous tubercle II. Supraspiracular area darker dorsally, particularly in a marginal black dash anteriorly on abdominal segments. Spiracles pale, in a whitish spot. A broad, sharply defined yellow or whitish subventral stripe more or less mottled with ferruginous. Setigerous tubercles large, nearly flat, dark. Head grayish, yellowish or brownish, adfrontal areas and adjacent margin white, submedian arcs and reticulation ferruginous or brownish, darker dorsally.

Described from many live larvae collected about Clarksville, Tenn., in 1912. Moths were determined by Dyar.

*Distribution*.—California, Arizona, New Mexico, Texas, Kansas, Nebraska, Florida, Mississippi, South Carolina, North Carolina, Tennessee, Virginia, Illinois, Minnesota, Pennsylvania, New York, and Maine.

*Food plants*.—Prefers cereals and other grasses, but will attack a wide variety of plants.

### LAPHYGMA EXICUA (Hbn.)

Head 2 mm. broad. Body about 25 mm. long and 4 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color varying from green through soft shades of gray to brown.

The coloration in better marked specimens is approximately as follows: Middorsal pale line broken, often obscured by the margining dark lines. Pale line ventrad of setigerous tubercle II more distinct, margined dorsally anterior to II by a linear dark mark. Dorsum paler than supraspiracular area, with numerous dark longitudinal strands. Supraspiracular area uniformly dark except in a black ventral line, a black spot on mesothorax and a small pale spot dorso-posterior to each abdominal spiracle. Spiracles white or yellowish. Subventral stripe yellowish or pink margined dorsally by a white line, fading out ventrally. Venter green. Setigerous tubercles minute. Head pale with black submedian arcs and reticulation.

Described from numerous live and alcoholic larvae collected in Mississippi in March and May by H. W. Allen, and in Arizona in June and October by K. B. McKinney. Dyar determined moths.

*Distribution*.—Florida, Mississippi, Wisconsin, Texas, Oklahoma, Kansas, Nebraska, Colorado, New Mexico, Arizona, Utah, California, and Montana.

*Food plants*.—A very general feeder on field and garden crops, grasses, the foliage of trees and various weeds, especially pigweed (*Amaranthus*).

## PHOSPHILA Hbn.

Dorsal coloration composed of longitudinal black lines on a pale ground. Head black-----*turbulenta*  
 Coloration not as above. Head brownish green-----*miscioides*

## PHOSPHILA TURBULENTA Hbn.

Head 3 to 3.1 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments 7 and 8 slightly broadened and apparently with a rounded dorsal hump on 8; skin smooth; dorsal coloration consisting mainly of a series of black and pale longitudinal lines.

Cervical shield and dorsum posterior to abdominal segment 7 black with a pattern of pale (apparently white) spots. Coloration of remainder of dorsum composed of eleven black longitudinal lines alternating with twelve pale lines, the most ventral pale line including the spiracles. Spiracles white. Venter apparently brownish with a white line including setigerous tubercle V and another along bases of the prolegs. Setigerous tubercles minute. Legs black. Head entirely black excepting the white adfrontal sutures and median line.

Described from four inflated larvae collected in New Jersey, September 19, by Charles Rummel.

*Distribution*.—Georgia, Tennessee, Virginia, Illinois, Pennsylvania, New Jersey, Connecticut, and New York.

*Food plant*.—Greenbriar (*Smilax*).

## PHOSPHILA MISELIODES (Gn.)

Head 3 mm. broad. Body about 25 mm. long and 4.5 mm. broad at middle, abdominal segments 7 and 8 apparently broadened, with a decided, subconical middorsal hump on 8; skin smooth; general color green.

Body green throughout with the spiracles in a narrow white stripe. Spiracles white. Dorsal setigerous tubercles moderately large, flat, pale. Two ventral setae on tarsi broadly flattened, spatulate. Head brownish green, setae P<sup>1</sup> much farther apart than setae P<sup>2</sup> (44:31).

Described from one inflated and one alcoholic larva from the U. S. National Museum: the first labeled "B 728, collection II. (G. Dyar)"; the second labeled "Hibernating in cocoon, Hendersonville, N. C., Jerry Nelson coll."

*Distribution*.—Kansas, Texas, Florida, Georgia, North Carolina, Tennessee, Pennsylvania, Massachusetts, and New York.

*Food plant*.—Greenbriar (*Smilax rotundifolia*).

## AMPHIPYRA Ochs.

1. With a conspicuous, subconical middorsal hump on abdominal segment 8. Mandible with a basal tooth on oral face-----*pyramidoides*  
 Without a hump on abdominal segment 8. Mandible without a basal tooth on oral face-----2
2. Skin set closely both dorsally and ventrally with minute, spinelike granules. *tragopoginis*  
 Skin smooth-----*glabella*

## AMPHIPYRA PYRAMIDOIDES Gn.

Head 3 mm. broad. Body about 35 mm. long and 6 mm. broad, abdominal segments of about equal width to 8 which has a very pronounced subconical dorsal hump; skin smooth; general color whitish green.

A strong, continuous white middorsal line. Subdorsal line slender, broken, yellowish, well ventrad of setigerous tubercle II. Subventral pale stripe represented by a strong yellow line in the line of the spiracles, which margins the anal shield. Spiracles pale at centre or entirely black. Venter green with a slight pinkish suffusion. Setigerous tubercles minute, in yellow dots. Head green, unmarked.

Described from 3 larvae: 1 collected near Sacramento, Calif., May 1, 1932, on *Quercus wislizenii*, by H. H. Keiffer; 1 collected at Rimrock, Wash., May 24, 1933, by W. W. Baker; and 1 collected near Chicago, Ill., May 23, 1942, on hawthorn, by A. K. Wyatt. A moth emerged June 30, 1932, and was determined by Benjamin.

*Distribution.*—Occurs generally east of the Rocky Mountains north of the latitude of the southern boundaries of North Carolina and Tennessee and sparingly west of the mountains, the records including Arizona, California, Washington, and British Columbia.

*Food plants.*—Grape, raspberry, and generally on trees including oak, poplar, rhododendron, hawthorn, and redbud (*Cercis*).

#### AMPHIPYRA TRAGOPOGINIS (L.)

Head 2.5 to 2.7 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering slightly posteriorly; skin bearing minute spinelike granules both dorsally and ventrally; general color green.

Body unicolorous green throughout except as indicated. A strong white middorsal line. A slender white line well ventrad of setigerous tubercle II. Spiracles white. A strong, parallel-sided white subventral stripe partially including the spiracles and margining the anal shield. Setigerous tubercles of moderate size, slightly elevated, pale. Head green, without markings.

Described from 15 larvae collected in western Washington from about the middle of May to the last of June. Moths emerged in July, and were determined by Heinrich.

*Distribution.*—United States: Washington, Minnesota, Pennsylvania, New York, New Hampshire, and Maine. Canada: Newfoundland, Nova Scotia, New Brunswick, Quebec, and British Columbia.

*Food plants.*—Strawberry, plantain, *Campanula*, and *Penstemon*.

#### AMPHIPYRA CLABELLA (Morr.)

Head 1.9 mm. broad. Body about 27 mm. long and 4.5 mm. broad at middle, tapering on abdominal segments 8 and 9; skin smooth; general color green.

Uniformly green throughout except as indicated. A slender, sharp, white middorsal line. A very faint pale line well ventrad of setigerous tubercle II. Spiracles white with brown rim. Subventral pale stripe represented by a yellowish white line ventrad of the spiracles which margins the anal shield. Setigerous tubercles minute, in minute pale dots. Head quite small, dull whitish with very obscure darker reticulation.

Described from 20 larvae collected in the Seven Springs Recreation Area about 55 miles north of Phoenix, Ariz., late in April 1938. Moths emerged in June, and were determined by Heinrich.

*Distribution.*—New York, Pennsylvania, Illinois, Minnesota, Wisconsin, Kansas, Nebraska, North Dakota, Montana, Colorado, Utah, Arizona, and California.

*Food plant.*—Ash trees.

## CATABENA Wlk.

## CATABENA LINEOLATA Wlk.

Head 1.8 to 1.9 mm. broad. Body about 25 mm. long and 3.5 mm. broad at middle, tapering both anteriorly and posteriorly from median abdominal segments; skin smooth; general color dark greenish gray.

Except as noted, the coloration both dorsally and ventrally is composed of obscure, intermingled dark strands, flecks, and sinuate lines on a greenish ground. Middorsal and subdorsal pale lines scarcely traceable except on thorax. A narrow stripe including setigerous tubercles I and II darker at juncture of segments, otherwise indicated by the sinuate dark margining lines which include a linear white mark anterior to I on anterior abdominal segments. Spiracles white. Ventral half of suprascapular area paler than dorsal half, margined by dark lines, the dorsal including III, the ventral in the line of the spiracles. A paler subventral stripe. Setigerous tubercles minute except II on 8 and 9 moderately large and distinctly elevated. Head white or greenish white with longitudinal brownish or reddish stripes so disposed as to outline 3 longitudinal whitish lines dorsal of the ocelli on each side and a band of similar color ventrad of the ocelli.

Described from four inflated larvae from the U. S. National Museum: "*Adipsophanes miscellus*, April, Los Angeles Co., Calif., through C. V. Riley."

*Distribution*.—California, Arizona, New Mexico, Colorado, Montana, Texas, Kansas, Nebraska, Iowa, Missouri, Minnesota, Illinois, Tennessee, Pennsylvania, Connecticut, and New York.

*Food plant*.—*Verbena*.

## AMPHIPYRINAE, GROUP 8

1. Oral face of mandible with ribs 2 and 3 elevated near the base to form blunt prominences except in *Septis maxima* (pl. 5, K). Set II<sup>b</sup> on mesothorax and metathorax and III on abdominal segment 9 in a rather conspicuous, black, saucer-shaped depression, the seta on III weak, threadlike, of a character different from the adjacent setae (pl. 7, M). Setigerous tubercle II<sup>a</sup> on the cervical shield (pl. 7, Q). Includes no borers.----- 2
- Oral face of mandible without basal elevation of ribs 2 and 3 except in *Archana*. Seta II<sup>b</sup> on mesothorax and metathorax and III on abdominal segment 9 with the setal insertion surrounded by a superficial annulus not much different from that surrounding the bases of adjacent setae, the seta tending to be of the same character as adjacent setae but usually much smaller (pl. 7, N). Setigerous tubercle II<sup>a</sup> sometimes not on the cervical shield (pl. 7, L). Includes the borers.----- 3
2. Height of spiracle on abdominal segment 1 less than that of the prothoracic spiracle (24:27 or more). Anal shield rounded posteriorly. Produced long axis of spiracle on abdominal segment 2 anterior to seta III, the anterior deviation usually equal to twice width of annulus surrounding base of seta or more.----- *Septis* (including *Agroperina* and *Crymodes*)
- Height of spiracle on abdominal segment 1 greater than that of prothoracic spiracle (29:27). Anal shield truncate posteriorly. Produced long axis of spiracle on abdominal segment 2 contiguous or but slightly anterior to seta III. Third segment of labial palpus not more than half as long as basal segment. Each anterior proleg with 20 or more crochets in mature larva.----- *Chytonis*
3. Seta IV on abdominal segment 7 twice as near to the spiracle as to seta V, or more. Setigerous tubercle II<sup>a</sup> on the cervical shield.----- 10
- Seta IV on abdominal segment 7 at most but slightly nearer to the spiracle than to seta V, except that this character is variable in *Apamea kieferi* in which II<sup>a</sup> is not on the cervical shield.----- 4
4. Ocelli IV and VI less than the width of IV apart (7:9). Anal shield modified posteriorly.----- 5
- Ocelli IV and VI distinctly more than the width of IV apart (12:7 or more).----- 6

- 5. With but one seta on mandible. Occurs in Mississippi and Louisiana. Seta III on abdominal segment 8 directly anterior to the spiracle on a huge tubercle higher than the spiracle and including III<sup>a</sup>----- *Meropleon*  
With 2 setae on mandible. Generally distributed. Seta III on 8, when anterior to spiracle (*diversicolor*), on a small tubercle----- *Oligia*
- 6. Antero-dorsal setae on anal shield at least approximately twice as far from each other as from the posterolateral setae (46:25 or more). Anal shield depressed adjacent to lateral and posterior margins forming an elevated rim, the posterior margin somewhat crenulate or lobed

*Luperina Helotropa*

Anterodorsal setae on anal shield usually nearer to each other than to the anterolateral setae and at most (*Archunara*) but slightly nearer to the anterolateral setae (pl. 6, *D*). Anal shield sloping gradually to lateral and posterior margins with posterior margin uniformly rounded----- 7

- 7. Spiracles extremely narrow, the height equal to 3 times the width or more. Ribs 2 and 3 of mandible elevated near the base----- *Archunara*  
Spiracles of normal form, the height equal to approximately twice the width. Ribs 2 and 3 not elevated toward their bases----- 8

- 8. With two setae on mandible placed close together. Sieve plate of spiracle not sclerotized laterally (pl. 10, *M*). Mandible not crenulate distally on dorsal margin----- *Apanca Hydroccia*

With but one seta on mandible. Sieve plate of spiracle sclerotized laterally greatly reducing the air passage (pl. 10, *Q*). Mandible with dorsal margin usually rather obscurely crenulate distally----- 9

- 9. Mandible with a very large, conspicuous molar area on cutting margin dorsally. Anal shield longer than broad. Setigerous tubercle IV often smaller than V on abdominal segments posterior to 2. Bore in Lizard's Tail (*Saururus cernuus*)----- *Parapanca*

Mandible without a distal molar area. Anal shield broader than long. Setigerous tubercle IV larger than V on abdominal segments.

*Papaipema, Emboloccia*

- 10. Spiracles on abdominal segment 8 dorsal and facing posteriorly. Two setigerous tubercles of the VII group (VII<sup>a</sup> and VII<sup>b</sup>) present on abdominal segment 7. Labial palpus but one-third as long as spinneret (16:50). Setigerous tubercle IV postero-ventrad of the spiracle on abdominal segment 7----- *Arzama*

Spiracles lateral on abdominal segment 8. But one setigerous tubercle of the VII group on abdominal segment 7. Labial palpus and spinneret subequal in length. Setigerous tubercle IV posterior to the spiracle, in nearly the same position as on preceding segments----- 11

- 11. Spiracles extremely narrow, the height equal to nearly four times the width (38:10), sieve plates not sclerotized laterally. Seta O' the width of ocellus IV removed therefrom. Anal shield not modified posteriorly.

*Macronoctua*

Spiracles less than twice as high as wide (18:12), the sieve plates very evidently sclerotized, laterally greatly reducing the air passage (pl. 10, *Q*). Seta O' less than width of ocellus IV removed therefrom (5:8). With upturned, bluntly pointed projections on posterior margin of anal shield

*Achatodes*

**SEPTIS\* Hbn.**

There seem to be no characters of generic importance for the separation of larvae of *Septis*, *Agroperina*, and *Crymodes*, and the species of these genera are all included under *Septis* in the following key. The generic names in parentheses indicate the genera under which the species are usually listed.

- 1. Coloration of the white grub type, without definite markings. Hind coxae at least approximately the femur width apart, or more, except in *occidens*----- 2
- Coloration a definite pattern of longitudinal stripes with the spiracles included in a pale stripe. Hind coxae less than half the femur width apart----- 9

\*See comments, p. 3.

2. Height of front less than length of median line, (46:50). Hind coxae one-fourth width of femur apart..... *Septis occidens*  
 Height of front decidedly greater than length of median line..... 3
3. Middle coxae approximately width of femur apart or more. Length of median line of head usually equal to half height of front or less, except in *maxima*. Each proleg on abdominal segment 3 with 12 to 16 crochets in mature larva..... 4  
 Middle coxae not more than half width of femur apart. Length of median line of head usually equal to decidedly more than half height of front (28:44)..... 7
4. Skin with distinct coarse granules. Middle and hind coxae extremely far apart, the hind coxae twice width of femur apart (100:48). Occurs only on Pacific seaboard..... *Septis maxima*  
 Skin smooth or pavement granulose. Hind coxae less than twice femur width apart. Of more general distribution..... 5
5. Spiracles very high and narrow, approximately 3 times as high as wide (21:8 on 2). Head deep infuscated brown..... "*Septis*" *helca* (*Agroperina*)  
 Spiracles approximately twice as high as wide (26:12) on 2. Head brown... 6
6. Cervical shield and anal shield infuscated brown or blackish.  
 "*Septis*" *decolorator* (*Crymodes*)  
 Cervical shield and anal shield pale brown..... "*Septis*" *lignicolora*
7. Skin pavement granulose. Proleg on abdominal segment 3 with about 12 crochets in mature larva. Setigerous tubercle A<sup>3</sup> on head approximately the width of ocellus II removed therefrom... "*Septis*" *lutosa* (*Agroperina*)  
 Skin rugulose but without granules..... 8
8. Each anterior proleg with 8 to 12 crochets in mature larva. Setigerous tubercle A<sup>3</sup> the ocellar width or less from ocellus II. Difference in height of prothoracic and first abdominal spiracles tending to be on the order of 35:28 or more..... *Septis castanea*  
 Each anterior proleg with 14 to 18 crochets in mature larva. Setigerous tubercle A<sup>3</sup> at least slightly more than the ocellar width from ocellus II. Difference in height of prothoracic and first abdominal spiracles tending to be on the order of 35:31 or less..... "*Septis*" *debitans* (*Agroperina*)
9. Black rim of spiracle completely encircled by a definite, pale brown, sclerotized area. Smaller species, about 25 mm. long at maturity..... 10  
 Black rim of spiracle with a pale brown sclerotized area on anterior margin only or with none. Larger species, 30 mm. long or more at maturity.... 11
10. Spiracles dark gray or black. Head black above antennal insertion.  
*Septis finitima*  
 Spiracles brown. Submedian arcs extended laterad near base of front isolating a brown or pale area above antennal insertion..... *Septis indocilis*
11. Dorsal setigerous tubercles on abdomen very large, I and II on 1 much less than the transverse width of I apart (13:20). Skin smooth. General color gray..... *Septis plutonia*  
 Dorsal setigerous tubercles on abdomen of small to moderate size, I and II on 1 more than the transverse width of I apart (13:10)..... 12
12. Skin distinctly but minutely pavement granulose. General color blackish. Found only on the Pacific coast..... *Septis cuculliformis*  
 Skin smooth. Of more general distribution..... 13
13. General color gray to blackish..... 14  
 General color brownish..... 15
14. Head brown with close dark reticulation visible throughout. General color gray with a purplish tinge..... *Septis cariosa*  
 Head smoky brown with reticulation visible laterally only. General color blackish..... *Septis alia* (*rorulenta*)
15. Middorsal pale line margined by distinct uniform blackish lines with their lateral margin immediately dorsal of setigerous tubercle I. Setigerous tubercles I and II in a definite paler stripe..... *Septis apamiformis*  
 Middorsal pale line margined by a blackish area, darkest dorsally and thinning out laterally. Setigerous tubercles I and II not in a paler stripe  
*Septis vultuosa*

## SEPTIS OCCIDENS (Grt.)

Head 3.9 mm. broad. Body about 40 mm. long and 5 mm. broad at middle, tapering slightly posteriorly; skin pavement-granulose; general color sordid whitish.

Uniform sordid whitish, entirely without markings. Spiracles orange. Setigerous tubercles large, somewhat infuscated but inconspicuous. Cervical shield infuscated brown. Head a decided brown with narrow, black submedian arcs dorsally and subdued dark reticulation.

Described from three larvae collected a little east of Virden, Wash., in tunnels among grass roots beside buried stones in April. A moth emerged VI.4.35 and was determined by Clarke.

*Distribution.*—United States: California, Nevada, Utah, Colorado, Washington, and Montana. Canada: Alberta.

*Food plants.*—Grasses.

#### SEPTIS MAXIMA (Dyar)

Head 4.4 to 4.7 mm. broad. Body about 37 mm. long and 6 mm. broad at middle, tapering posteriorly; skin bearing coarse granules arranged in transverse lines; general color light gray or whitish sometimes tinged with pinkish.

Body without markings. Spiracles black, the air passage greatly reduced through lateral sclerotization of the sieve plate. Setigerous tubercles large, flat, concolorous with the skin. Cervical shield pale brownish. Legs on mesothorax and metathorax extremely far apart. Head a decided brown, roughened but not granulose.

Described from many larvae collected on sand dunes on the seacoast of Washington and Oregon. Nearly all larvae are mature by the middle of May. Moths emerged in June and July, and were determined by Benjamin.

*Distribution.*—United States: California, Oregon, and Washington. Canada: British Columbia.

*Food plants.*—Grasses. The larvae feed several inches below the surface of the sand. In grasses with large, hard stems, such as *Calamagrostis nutkaensis*, the larvae bore a hole to the heart of the stem, tunneling this for a short distance without remaining permanently in the burrow.

#### "SEPTIS" HELVA (Grt.) (ACROPERINA)

Head 3.6 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, tapering slightly posteriorly; skin pavement-granulose; general color whitish with dark infuscated brown head.

Body without markings. Setigerous tubercles, including I and II, large, blackish, III and IV distinctly elevated. Spiracles brown, very narrow the height being equal to approximately 3 times the width (21:8). All ventral prolegs with about 16 crochets each. Middle coxae the femur width apart (16:16). Cervical and anal shields brown. Head deep infuscated brown or blackish, front height equal to approximately twice the length of the median line (38:19).

Described from six larvae collected near Sioux City, Iowa, in May 1918 by C. N. Ainslie from sod. Reared moths were determined by Dyar.

*Distribution.*—Colorado, Kansas, Nebraska, Iowa, Illinois, Minnesota, Maryland, Pennsylvania, New Jersey, Connecticut, Massachusetts, New York, and New Hampshire.

*Food plant.*—Found in sod.

#### "SEPTIS" DEVASTATOR (Brace) (CRYMODES)

Head 4.3 to 4.6 mm. broad. Body about 35 to 40 mm. long and 5.5 mm. broad at middle, tapering slightly posteriorly; skin obscurely pavement-granulose; general color translucent greenish white with a dark subcutaneous middorsal line.

Body without markings. Setigerous tubercles rather large, flat, concolorous with adjacent parts or slightly infuscated, more distinct in earlier instars. Spiracles brown. Prolegs with about 12 crochets each throughout. Cervical shield conspicuous infuscated brown. Anal shield decidedly infuscated or blackish. Head bright reddish brown, showing but traces of dark submedian arcs and reticulation.

Described from several live larvae from Sioux City, Iowa, and Fargo, N. Dak., received from C. N. Ainslie, and 11 preserved specimens collected in Oregon by L. P. Rockwood. Larvae were collected from March to June, becoming mature in May and June, and moths emerged in June, July, and August. Crumb (19) gives an account of this species not including a figure of the larva.

*Distribution.*—Generally distributed throughout the United States, except rare or absent south of the Ohio River, and in all of the adjacent Provinces of Canada.

*Food plants.*—Essentially a subterranean, sod-feeding species, but is destructive to many plants other than grasses in the absence of its normal food.

#### SEPTIS LICNICOLORA (Gn.)

Head 4.3 to 4.6 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering somewhat posteriorly; skin with irregular impressed lines, not granulose; general color whitish.

A distinct dark subcutaneous middorsal line, no other markings. Setigerous tubercles concolorous with adjacent parts, I and II little more than setal insertions, remaining dorsal tubercles larger but inconspicuous. Spiracles brown. Cervical shield pale brown or yellowish. Each anterior proleg with about 13 crochets. Head a decided reddish brown, entirely without markings.

Described from 1 inflated and 3 alcoholic larvae labeled "Morrison Co., Minn., June 11, 1919," reared by W. C. Cook, and 13 larvae collected in June at Puyallup, Wash., in tunnels 2 to 3 inches below the surface among roots of quack grass.

*Distribution.*—United States: Arizona, California, Washington, Montana, North Dakota, Minnesota, Iowa, Illinois, North Carolina, New Jersey, Pennsylvania, Connecticut, Massachusetts, New Hampshire, New York, and Maine. Canada: Quebec, Ontario, Manitoba, and British Columbia.

*Food plants.*—Quack grass (*Agropyron repens*) and other grasses.

#### "SEPTIS" LUTOSA (Andr.) (ACROPERINA)

Head 4.2 mm. broad. Body about 30 mm. long and 5.5 mm. broad at middle, tapering somewhat posteriorly; skin obscurely pavement-granulose; general color sordid whitish, without markings.

Spiracles brown. Setigerous tubercles moderately large, darker than adjacent parts. Cervical shield brown. Head brown overlaid by infuscation.

Described from 12 larvae collected at Wakeman, Ohio, April 11, 1917, by W. S. Hall among roots of couch grass (*Agropyron repens*). Larvae were mature in April and May. Four moths emerged before the middle of June and were determined by McDunnough.

*Distribution.*—United States: South Dakota, Iowa, Minnesota, Ohio, Pennsylvania, New York, Connecticut, Massachusetts, and New Hampshire. Canada: Manitoba.

*Food plants.*—Couch grass (*Agropyron repens*) and probably other grasses.

## SEPTIS CASTANEA (Gr.)

Head 4 to 4.3 mm. broad. Body about 37 mm. long and 6 mm. broad at middle, tapering posteriorly; skin smooth with numerous irregular impressed lines: general color sordid gray sometimes tinged with pinkish or pale brown.

Color uniform sordid gray without markings. Spiracles dark brown. Setigerous tubercles large, not conspicuously darker than adjacent areas, I flat and smaller than II, other tubercles somewhat convex. Cervical shield brown margined with black. Head clear brown or overlaid with infuscation with dark reticulation laterally, no submedian arcs.

Described from many larvae collected about Puyallup, Wash., in April and May. Moths emerged in May and June, and were determined by Benjamin and by Clark.

*Distribution.*—United States: California, Oregon, and Washington. Canada: British Columbia and Alberta.

*Food plants.*—Grasses.

## "SEPTIS" DUBITANS (Wlk.) (AGROPERINA)

Head 4.2 to 4.3 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering posteriorly; skin smooth with many impressed lines on dorsum; general color sordid gray varying to dark gray, usually tinged with pinkish dorsally.

Body without markings. Spiracles brown. Setigerous tubercles large, flat, black or blackish. Cervical shield yellow narrowly margined with black. Head either clear brown or somewhat infuscated brown, obscure reticulation sometimes present laterally, no submedian arcs.

Described from many larvae collected in Washington in March, April, and May. Moths emerged in June and July, and were determined by Benjamin.

*Distribution.*—Occurs in California, Utah, Colorado, Oregon, Idaho, Washington, Tennessee, North Carolina, Minnesota, Pennsylvania, Connecticut, Massachusetts, Vermont, New York, and Maine; in all of the adjacent Provinces of Canada except New Brunswick and Saskatchewan, and in Alaska.

*Food plants.*—Grasses.

## SEPTIS FINITIMA (Gr.)

Head 3.1 to 3.3 mm. broad. Body about 25 mm. long and 4.5 mm. broad at middle, abdominal segments of about equal width to 8; skin coarsely and intricately rugulose but not granulose; general color purplish gray.

A strong middorsal whitish stripe. A subdued pale stripe ventrad of setigerous tubercle II. Dorsum to II and an area including the spiracles spotted and liturate with black. Spiracles dark gray, in a whitish area. No definite subventral pale stripe. Venter reticulate with pinkish and white. Setigerous tubercles large, flat, black. Head brown with infuscated brown submedian arcs and reticulation.

Described from 2 larvae collected at Puyallup, Wash., in September and 6 determined alcoholic specimens received through the kindness of J. H. Hawkins and labeled: "Presque Isle, Me., Aug. 20, 1931." Cridde (16) and Hawkins (28) have published accounts of this species.

*Distribution.*—United States: California, Nevada, Washington, Montana, Minnesota, Pennsylvania, New Jersey, Massachusetts, Vermont, New York, and Maine. Also Alaska. Canada: Nova Scotia, Quebec, Ontario, Manitoba, Alberta, and British Columbia.

*Food plants.*—Wheat, wild rice, timothy, corn (teste Hawkins), and grasses.

## SEPTIS INDOCILIS (Wlk.)

Head 3.2 mm. broad. Body about 20 mm. long and 4 mm. broad at middle, abdominal segments of about equal width to 8; skin smooth; general color gray very slightly tinged with purplish.

Except as indicated dorsum to and including setigerous tubercle III of one shade except slightly darker dorsally, composed of dark reticulation on a pale ground faintly tinged with purple. A narrow, continuous, pale middorsal stripe. A pale stripe less sharply defined than the middorsal immediately ventrad of II. From ventrad of III to and including V a distinct pale stripe transversely lined with infuscated pinkish. Spiracles a decided brown. Venter lined with white and infuscated purplish, the lines transverse midventrally. Setigerous tubercles inconspicuous, flat, black, rather small, I larger than II. Head a decided brown, not suffused with infuscation, with black submedian arcs and reticulation, the arcs turning outward to the ocelli near base of front segregating a brown area above the base of the antenna.

Described from nine larvae collected on the seacoast in Oregon and Washington in April. Moths emerged in May and June, and were determined by Clarke.

*Distribution.*—United States: Oregon, Washington, Montana, Minnesota, Pennsylvania, New York, and Maine; also Alaska. Canada: Nova Scotia, Quebec, Ontario, Manitoba, Alberta, and British Columbia.

*Food plants.*—Coarse grasses and sedges.

## SEPTIS PLUTONIA (Gr.)

Head 2.9 to 3 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color gray with a faint purplish tinge.

Dorsum to and including setigerous tubercle III of uniform shade excepting the pale lines. A broad, continuous middorsal pale line. Pale stripe ventrad of II indistinct. Ventrad of III and sharply defined the gray coloration is more dilute and tinged somewhat with pinkish. Spiracles brown. Setigerous tubercles large, flat, black, I larger than II particularly on anterior and posterior abdominal segments. Cervical shield and anal shield black with three pale lines. Head deep brown, heavily overlaid with infuscation, with black submedian arcs and reticulation.

Described from 15 larvae collected about Puyallup, Wash., in February, March, and April. Moths emerged in May, and were determined by Clarke.

*Distribution.*—United States: Washington, Montana, Minnesota, Pennsylvania, and Massachusetts. Canada: New Brunswick, Ontario, Manitoba, Alberta, and British Columbia.

*Food plants.*—Grasses.

## SEPTIS CUCULLIFORMIS (Gr.)

Head 3.2 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering slightly posteriorly; skin distinctly, minutely pavement-granulose; general dorsal color dark gray or blackish.

Dorsal coloration to and including setigerous tubercle III composed of a close, obscure and uniform blackish reticulation except as indicated, with the dorsal portion of the supraspiracular area somewhat darker than the dorsum proper. A narrow pale middorsal stripe and a similar stripe immediately ventrad of setigerous tubercle II, both subdued by overlying dark reticulation. Spiracles brown, well within the white subventral stripe which extends to V. Venter pale. Setigerous tubercles small, flat, black. Head smoky brown with traces of freckles medially and dark reticulation laterally, no submedian arcs.

Described from 8 larvae including 7 collected at Puyallup, Wash., in March and May, and 1 determined inflated specimen from the U. S.

National Museum labeled "Santa Cruz Mts., California, 637, A. Koebele, collector."

*Distribution*.—California, Oregon, and Washington.

*Food plants*.—*Elymus condensatus* (teste Koebele) and other coarse grasses.

#### SEPTIS CARIOSA (Gn.)

Head 3 to 3.2 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general dorsal color uniform grayish tinged with purple.

A continuous middorsal pale stripe. An indefinite pale stripe ventrad of setigerous tubercle II. From ventrad of III to and including V a pale band. Spiracles brown. Venter sordid whitish much flecked with white. Setigerous tubercles large, flat, nearly or quite black, I and II of about equal size. Head brown with black submedian arcs and reticulation, the arcs sometimes obscure.

Described from numerous larvae collected about Clarksville, Tenn., in March. Moths emerged in April and May, and were determined by Dyar.

*Distribution*.—Texas, Kansas, Tennessee, North Carolina, Minnesota, Wisconsin, Illinois, Ohio, Pennsylvania, New Jersey, Maryland, Connecticut, Massachusetts, New York, and Maine.

*Food plants*.—Grasses. A larva collected among forest leaves was reared for several weeks on dead oak leaves.

#### SEPTIS ALIA (Gn.) (RORULENTA Sm.)

Head 3 to 3.1 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color blackish with very faint middorsal and subdorsal pale stripes.

Dorsum blackish to ventrad of III, sometimes tinged faintly with purplish. Middorsal pale stripe faint. Pale stripe ventrad of setigerous tubercle II barely indicated. A pale stripe from ventrad of III to but not including V, including the spiracles. Spiracles brown. Venter dark. Setigerous tubercles flat, black, I and II of moderate size, III much larger, IV much smaller than III. Cervical shield black with 3 pale lines. Head pale brown with black submedian arcs and reticulation, overlaid and subdued by infuscation.

Described from 16 larvae collected about Puyallup, Wash., in March and April. Moths emerged in June, and were determined by McDunnough.

*Distribution*.—United States: Washington, Oregon, Montana, Utah, Colorado, Minnesota, Pennsylvania, New Jersey, Connecticut, Massachusetts, New York, New Hampshire, and Maine. Canada: Quebec, Saskatchewan, Alberta, and British Columbia.

*Food plants*.—Grasses.

#### SEPTIS APAMIFORMIS (Gn.)

Head 3 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of about equal width to 8; skin smooth; general color brownish.

Middorsal pale line narrow, distinct and nearly continuous, margined by distinct, uniform black lines less distinct at the incisures, their lateral margins at setigerous tubercle I. A pale stripe including I and II from which the pale line ventrad of II is scarcely differentiated. A dark band including III and darker at ventral margin. Spiracles brown, within the pale subventral stripe which extends to V. Venter brownish, of dilute dorsal coloration. Setigerous tubercles small, flat, black. Cervical shield black with three pale lines. Head brown with black submedian arcs and full black reticulation.

Described from four inflated larvae from the U. S. National Museum labeled (2) "No. 2491, Dec. 4, 1881, Va." and (2) "March 31, 1882."

*Distribution*.—United States: South Dakota, Wisconsin, Illinois, Minnesota, Maryland, Virginia, Pennsylvania, New Jersey, Massachusetts, and New York. Canada: Quebec and Ontario.

*Food plants*.—Unknown but probably grasses.

#### SEPTIS VULTUOSA (Grt.)

Head 3 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, tapering slightly posteriorly; skin smooth; general dorsal color brownish with a dark middorsal area.

Body dorsad of the spiracles reticulate throughout with blackish on a pale brownish ground. A strong but somewhat broken middorsal pale line bordered by a dark shade thinning out laterally to setigerous tubercle I. Pale stripe immediately ventrad of II indistinct, indicated by a more definite reddish brown area than occurs elsewhere. Infuscation slightly more evident in a stripe including III. Spiracles a distinct, strong brown, well within the subventral pale stripe. Subventral pale stripe not prominent but sharply defined, composed of isolated pale flecks and extending to but not including V. Venter to base of prolegs pale, flecked with white, with transverse white streaks midventrally. Setigerous tubercles flat, black, III, IV, and V much larger than I and II. Anal shield and cervical shield black with three pale lines. Head infuscated brown with black submedian arcs and reticulation.

Described from one larva collected at Puyallup, Wash., March 16, 1933. A moth emerged April 13, 1933, and was determined by Benjamin.

*Distribution*.—Occurs in Washington, North Dakota, New Jersey, Pennsylvania, New York, Maine, in all of the adjacent Provinces of Canada, and in Alaska.

*Food plants*.—Grasses.

#### CHYTONIX Grt.

1. Length of median line of head much greater than height of front (48:30). Head with dark freckles. Middorsal and subdorsal pale lines on body indistinct.----- Species No. 30  
Length of median line and height of front subequal (38:35). Middorsal and subdorsal pale lines on body distinct.----- 2
2. General color blackish tinged with purple. Middorsal and subdorsal lines yellow. Head pale brown with darker brown freckles.----- *divesta*  
General color sordid gray. Middorsal and subdorsal lines whitish. Head pale brown, unmarked.----- Species No. 31

#### CHYTONIX SP. (No. 30)

Head 3 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering posteriorly; skin pavement-granulose; general color sordid gray.

Body apparently without markings. Middorsal and subdorsal pale lines not indicated in the material at hand. Spiracles deep infuscated brown. Subventral pale stripe absent. Venter pale. Setigerous tubercles large, black, nearly flat. Each anterior proleg with about 25 crochets. Cervical and anal shields pale brown. Hind coxae touching. Head pale brown with dark freckles.

Described from two alcoholic larvae collected near Tieton, Wash., May 30, 1939. No moth was reared.

*Distribution*.—Washington.

*Food plants*.—Grasses.

## "CHYTONIX" DIVESTA (Grt.)

Head 2.5 to 2.7 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering posteriorly; skin pavement-granulose; general dorsal color dilute blackish tinged with purple.

Dorsal coloration including setigerous tubercle II uniform dilute black excepting the strong continuous yellow middorsal line. A strong yellow stripe ventrad of II. Supraspiracular area to and partially including the spiracles of same shade as dorsum but more dilute and tinged with purplish. Spiracles brown. Subventral stripe yellow, sometimes obscure. Venter pale tinged with purple. Setigerous tubercles large, flat, black, I and II smaller than III and IV. Hind coxae touching. Head pale brown with somewhat darker brown freckles.

Described from six larvae collected in Washington in June and July. A moth emerged July 30, 1936, and another August 26, 1937. These were determined by Clarke.

*Distribution.*—United States: Arizona, California, Nevada, Utah, Oregon, Idaho, Washington, and Montana. Canada: Manitoba and British Columbia.

*Food plants.*—Grasses.

## CHYTONIX SP. (No. 31)

Head 3 mm. broad. Body about 25 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin pavement-granulose; general color sordid gray tinged with green in earlier instars.

Body of one shade dorsally to and including the spiracles, excepting the pale lines, but dorsum to setigerous tubercle II somewhat darker than the sides and the area between II and III paler than elsewhere. A slender, subdued mid-dorsal pale line. A much stronger pale line ventrad of II. Spiracles deep infuscated brown. No subventral pale stripe. Venter whitish, unmarked. Setigerous tubercles moderately large, nearly flat, black, I and II smaller than III and IV. Hind coxae touching. Cervical shield pale brownish. Head pale brown, unmarked.

Described from 14 larvae collected near Superior and near the Seven Springs Recreation Area 54 miles north of Phoenix, Ariz., in May. No moth was reared.

*Distribution.*—Arizona.

*Food plants.*—*Elymus glaucus*, *Hordeum murinum*, and probably other grasses.

## MEROPLEON Dyar

## MEROPLEON COSMION Dyar

Head 2.5 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin smooth; general dorsal color pink.

Pink dorsally, pale elsewhere, without markings. Spiracles brown, narrow, sieve plate sunken and sclerotized laterally. Setigerous tubercles flat, brown, of moderate size anteriorly but decidedly larger on abdominal segments 7, 8, and 9, III directly anterior to the spiracle on 8 on a very large sclerotized area including III, I, II, and III fused across the dorsum on 9. Cervical shield brown with II<sup>c</sup> in lateral margin. Anal shield brown with black freckles, posterior margin darker and elevated forming a narrow crenulate rim, the posterior setal insertions on the ventral surface and not visible in a dorsal view. Head brown, apparently unmarked, but one seta on mandible, ocelli IV and VI less than the width of IV apart (7:9).

Described from 1 mature and 5 immature alcoholic larvae from U. S. National Museum collected at Lockport, La., May 24, 1944, in sugar cane. Bynum and Holloway (?) give an account of this species.

*Distribution.*—Louisiana and Mississippi.

*Food plants.*—Bores in sugarcane, a grass (*Erianthus saccharoides*), and occasionally in corn.

#### OLIGIA Hbn.

1. Height of spiracle on abdominal segment 8 very much greater than that of prothoracic spiracle (41:26), with setigerous tubercle III directly anterior to the spiracle and well below its dorsal end. Setigerous tubercle IV on prothorax approximately the spiracle height anterior thereto (29:31). Median line of head approximately equal to height of front (27:30). Insertions of posterior setae on anal shield on posterior edge. Line P<sup>1</sup>-P<sup>2</sup> above apex of front. Front triangular, the sides nearly straight. *diversicolor*  
Height of spiracle on abdominal segment 8 not strikingly greater than that of prothoracic spiracle (22:18), with setigerous tubercle III far above dorsal end of spiracle. Setigerous tubercle IV on prothorax approximately twice the spiracle height anterior thereto (31:17)----- 2
2. Length of median line of head equal to approximately one-ninth the height of the front (5:45). Insertions of posterior setae on anal shield in black spots on the ventral surface and not visible in a dorsal view. Line P<sup>1</sup>-P<sup>2</sup> well below apex of front. Skin set closely with small rounded granules. Setigerous tubercles II<sup>a</sup> and II<sup>b</sup> on separate tubercles on mesothorax and metathorax----- *fractilinea*  
Length of median line of head equal to slightly less than half height of front (21:48). Insertions of posterior setae on anal shield on posterior edge and visible in a dorsal view. Line P<sup>1</sup>-P<sup>2</sup> at apex of front. Skin smooth. Setigerous tubercles II<sup>a</sup> and II<sup>b</sup> fused to form one plate on mesothorax and metathorax----- *indirecta*

#### OLIGIA DIVERSICOLOR Morr.

Head 2.1 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color pale, suffused dorsally with pink.

Body apparently without markings. Spiracles brown, that on abdominal segment 8 extraordinarily large, the height much greater than that of the prothoracic spiracle (41:26). Setigerous tubercles very small, scarcely more than setal insertions. Cervical shield pale brown. Anal shield brown, the posterior margin darker, elevated and somewhat crenulate, the posterior setae on the posterior margin. Head brown without markings except a blackish area about the ocelli.

Described from four larvae as follows: (2) "VII.25, Green Village, N. J.," from Chas. Rummel, and (2) "VI.26, 1940, Chicago, Ill., in *Carex* sp.," from A. K. Wyatt.

*Distribution.*—United States: Illinois, Minnesota, Pennsylvania, New Jersey, New York, Connecticut, Massachusetts, and Maine. Canada: Quebec.

*Food plants.*—Bores in various sedges.

#### OLIGIA FRACTILINEA (Grt.)

Head 1.4 to 1.6 mm. broad. Body about 25 mm. long and 3.6 mm. broad at middle, tapering posteriorly; skin bearing small rounded granules; general color apparently pale with dark stripes including setigerous tubercles I and II and the spiracles.

A pale middorsal line broadened on median abdominal segments. A dark stripe, apparently dark brownish, including setigerous tubercles I and II. A darker stripe extending from ventrad of III to and partially including the spiracles. Spiracles brown. No subventral pale stripe. Venter pale. Setigerous tubercles minute except that II on abdominal segment 9 may be surrounded by a flat sclerotized area, II<sup>a</sup> and II<sup>b</sup> close on mesothorax and metathorax but not on one tubercle. Cervical shield pale brown. Anal shield brown elevated and faintly bilobed posteriorly, the posterior setae in black spots on the ventral surface, their

insertions not visible in a dorsal view. Head small, brown with the front extremely high, the height equal to about nine times the length of the median line (45:5).

Described from three alcoholic larvae from the U. S. National Museum: "*Oligia fractilinea*, corn, Toledo, Ohio, Feb. 1930, J. C. Silver coll."

*Distribution*.—Arizona, Utah, Colorado, Montana, Texas, Arkansas, Iowa, Wisconsin, Minnesota, Illinois, Florida, Georgia, North Carolina, Tennessee, Ohio, Pennsylvania, New Jersey, New York, Massachusetts, Vermont, and Maine.

*Food plants*.—Corn and other grasses.

#### OLIGIA INDIRECTA (Grt.)

Head 1.7 mm. broad. Body about 30 mm. long and 3.5 mm. broad at middle, tapering posteriorly; skin smooth; general dorsal color pale brownish, venter white.

Body to and including setigerous tubercle II sordid pinkish, this area sharply defined laterally. A broad but not conspicuous yellowish middorsal line. A similar line ventrad of setigerous tubercle II. Ventrad of this to the spiracles of the dorsal color. Spiracles brown. Venter white. Setigerous tubercles of moderate size, flat, black, I and II on abdominal segment 9 on one plate fused across the dorsum, II<sup>a</sup> and II<sup>b</sup> on mesothorax and metathorax on one tubercle. Cervical shield pale brown the anterior margin black. Anal shield brown, posterior margin elevated and slightly crenulate, the posterior setae on posterior edge. Head pale brown darkened at the ocelli.

Described from many larvae collected near Puyallup, Wash., in April and May. Moths emerged early in July, and were determined by Heinrich and by Clarke.

*Distribution*.—United States: California, Nevada, Utah, Colorado, Wyoming, Oregon, and Washington. Canada: British Columbia.

*Food plants*.—Bores in grasses and sedges.

#### LUPERINA Bdv.

#### HELOTROPHA Led.

1. Posterior setae on anal shield alternating with upright sclerotized projections. Bore in grasses or sedges. Head of mature larva 2.3 to 2.7 mm. broad. No upright projections on posterior margin of anal shield. Feeds in or on roots of dock (*Rumex*). Head of mature larva 3.4 to 3.6 mm. broad  
*Luperina passer*
2. Cervical shield brown with narrow black anterior margin. Setigerous tubercles black  
*Helotropha reniformis*  
Cervical shield yellowish without black anterior margin. Setigerous tubercles inconspicuous brownish  
*Luperina stipata*

#### LUPERINA STIPATA (Morr.)

Head 2.5 to 2.7 mm. broad. Body about 30 mm. long and 5.5 mm. broad at middle, tapering posteriorly; skin smooth; general color pale yellowish with reddish brown longitudinal stripes which may be faint in the mature larva.

A pale middorsal line. A reddish brown stripe including setigerous tubercles I and II. A broad pale stripe between II and III bearing a submedian reddish brown line. A reddish brown stripe including III but not including the spiracles except on posterior segments. Spiracles brown. An indefinite pale subventral stripe. Venter pale. Setigerous tubercles of moderate size, flat, brownish, inconspicuous, II fused across the dorsum on abdominal segment 9. Cervical shield yellowish. Anal shield yellowish, the posterior margin elevated and somewhat crenulate, the posterior setae alternating with 5, upright, subconical projections. Head yellowish, unmarked

Described from five alcoholic larvae: "Ames, Iowa, VII.9.28, G. C. Decker coll." Decker (21) has published a full illustrated account of this species.

*Distribution*.—United States: Montana, Colorado, Minnesota, Wisconsin, Iowa, Illinois, Indiana, Ohio, Pennsylvania, New York, Massachusetts, New Hampshire, and Maine. Canada: Nova Scotia, New Brunswick, Ontario, and Manitoba.

*Food plants*.—Various grasses including oats and corn, but preferring slough grass (*Spartina michauxiana*) (teste Decker).

#### LUPERINA PASSER (Gn.)

Head 3.4 to 3.6 mm. broad. Body about 35 mm. long and 6 mm. broad at middle, tapering posteriorly; skin obscurely pavement-grauulose; general color whitish, the dorsum tinged with purplish.

Body without markings. Spiracles brown. Setigerous tubercles rather large, flat, concolorous with body or faintly brown, tubercles II apparently fused across the dorsum on abdominal segment 9. Cervical shield pale brown to infuscated brown. Anal shield a decided brown, the posterior margin elevated and somewhat crenulate, the posterior setae on the posterior rather than the dorsal margin. Head reddish brown, without markings.

Described from many mature larvae collected at Puyallup, Wash., from October to the middle of May. Moths emerged in July, and were determined by Clarke.

*Distribution*.—United States: California, Arizona, Utah, Colorado, Wyoming, Oregon, Washington, Montana, Nebraska, Illinois, Minnesota, Ohio, Pennsylvania, New Jersey, New York, Connecticut, Massachusetts, and New Hampshire. Canada: Newfoundland, Manitoba, Alberta, and British Columbia.

*Food plant*.—Bores in and feeds externally on roots of dock (*Rumex*).

#### HELOTROPHA RENIFORMIS (Grt.)

Head 2.3 to 2.5 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering slightly posteriorly; skin smooth; general color sordid blackish.

A subdued pale middorsal line and a similar pale line immediately ventrad of setigerous tubercle II, body otherwise sordid blackish to base of prolegs, this color being somewhat more intense dorsally. Spiracles brown. Venter sordid whitish, unmarked. Setigerous tubercles large, flat, black, III very large on mesothorax and metathorax, tubercles II fused across the dorsum and sometimes including I and III on abdominal segment 9. Cervical shield infuscated brown with black anterior margin. Anal shield brown, the posterior margin elevated and somewhat crenulate, the posterior setae on posterior edge. Head brown, an infuscated spot with P<sup>1</sup> and P<sup>2</sup> in dorsal margin, otherwise unmarked.

Described from 18 larvae collected in a swamp 1½ miles east of Dieringer, Wash., June 7, 1938, boring in a large round-stemmed sedge, probably *Scirpus occidentalis*. Moths emerged in July, and were determined by Clarke.

*Distribution*.—United States: California, Utah, Washington, Montana, Wisconsin, Illinois, Minnesota, Pennsylvania, New Jersey, New York, Connecticut, Massachusetts, New Hampshire, and Maine. Canada: Nova Scotia, Ontario, Manitoba, Alberta, and British Columbia.

*Food plant*.—Bores in a sedge, probably *Scirpus occidentalis*.

## ARCHANARA Wlk.

## ARCHANARA OBLONGA (Grt.)

Head 3.2 to 3.7 mm. broad. Body about 50 mm. long and 5 mm. broad at middle, tapering slightly posteriorly; skin smooth; general color pale gray with narrow, brownish longitudinal stripes which become less evident in later instars.

Pale brownish stripes including setigerous tubercles I and II; slightly dorsal of III and including III and the spiracles. Spiracles pale yellowish white, very narrow, the height equal to three times the width or more (38:12). No subventral pale stripe. Setigerous tubercles of moderate size, flat, black, I, II, and III free on abdominal segment 9. Cervical shield pale brownish, not including II'. Anal shield pale brownish, not modified posteriorly, posterior setae on dorsal margin. Head pale brownish gray with dark freckles.

Described from many larvae collected near Clarksville, Tenn., in June, and near Puyallup, Wash., in July. Moths from the Puyallup larvae emerged in August, and were determined by Schaus.

*Distribution.*—United States: Washington, California, Utah, Nebraska, Texas, Florida, Tennessee, Illinois, Minnesota, Ohio, Pennsylvania, New Jersey, New York, and Maine. Canada: Quebec and Ontario.

*Food plant.*—Bores in stems of cattail (*Typha*).

## APAMEA\* Ochs.

## HYDROECIA Gn.

1. With dull purplish longitudinal stripes. Setigerous tubercles II on abdominal segment 9 separate, not fused across the dorsum. Feeds in rootstocks of Iris. Occurs in Washington, Oregon, Utah, and California

*Apamea kieferi*

Dark markings, when present, in the form of transverse bands. Setigerous tubercles II fused across the dorsum on abdominal segment 9..... 2

2. Head yellow. Transverse dark bands present on mature larva. Head 3 mm. broad or less..... 3

Head dark brown. Transverse dark bands absent on mature larva. Head 3.6 mm. broad. Feeds on hop. Widely distributed..... *Hydroecia immanis*

3. Spiracles yellow or pale brown. Anal shield with black anterior margin. Line P<sup>1</sup>-P<sup>1</sup> on head at apex of adfrontal areas. Bores in stems of grass. Reported from Kansas and New York only..... *Apamea crepta*

Spiracles deep infuscated brown or black. Anal shield without black anterior margin. Line P<sup>1</sup>-P<sup>1</sup> below apex of adfrontal areas. Bores in stems of various plants, apparently preferring potato. Occurs in Maine and the adjacent area in Canada..... *Hydroecia micacea*

## HYDROECIA IMMANIS Gn.

Head 3.6 mm. broad. Body about 40 mm. long and 8 mm. broad at middle, tapering posteriorly; skin smooth; general color pinkish.

Body suffused with pinkish and without markings. Transversely segmentally banded with dark purplish in earlier instars. Spiracles dark brown or black, the sieve plate not sclerotized laterally. Setigerous tubercles large, nearly flat, black, III the smallest, the remaining dorsal tubercles to VI of approximately equal size, tubercles II fused across the dorsum on abdominal segment 9. Cervical shield brown with anterior margin dark. Anal shield infuscated brown, muscle attachments black, not modified posteriorly, the posterior setae on the posterior rather than the dorsal margin. Head dark brown, without markings.

\*See comments, p. 3.

Described from 2 mature and 1 immature alcoholic larvae without data from the U. S. National Museum, and 1 immature inflated specimen collected at Rye, N. Y., June 4, 1912, by Henry Bird.

In western Washington (*Kapowsin*), an external feeder on the roots of lupine (*Lupinus polyphyllus*), is found having the same size and structure as *immanis*, but differing in earlier instars in that the lupine feeder lacks the transverse dark bands found in *immanis*.

*Distribution*.—United States: Utah, Colorado, Iowa, Illinois, Pennsylvania, New Jersey, New York, Massachusetts, and New Hampshire. Canada: New Brunswick and Manitoba.

*Food plant*.—Hop (*Humulus*), the larva boring in new growth of the vine when young but feeding exteriorly at the crown in later instars.

#### HYDROECIA MICACEA (Esp.)

Head 3 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, tapering posteriorly; skin smooth; general color pale with transverse purplish bands.

Body with a transverse purplish band on each segment except prothorax and abdominal segment 9, including the setigerous tubercles and present both dorsally and ventrally. Spiracles deep infuscated brown or black. Setigerous tubercles of moderate size, flat, black, I, II, and III of about equal size, IV, V, and VI distinctly larger, tubercles II fused across the dorsum on abdominal segment 9. Cervical shield pale yellow with narrow black margins. Anal shield infuscated brown, not modified posteriorly, the posterior setae on the dorsal margin. Head yellow, without markings.

Described from 1 mature inflated European larva from Staudinger and Bang-Haas and 1 immature inflated European specimen from Henry Bird.

*Distribution*.—Maine and the adjacent area in Canada.

*Food plants*.—Bores in the stems of various plants apparently preferring potato.

#### APAMEA EREPTA (Grt.)

Head 2.4 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, tapering posteriorly; skin smooth; general color whitish with a dark purplish transverse band on each segment except prothorax and abdominal segment 9.

The transverse purplish bands include the tubercles and spiracles and are obsolete midventrally, no other body markings. Spiracles pale yellowish or pale brown. Setigerous tubercles of moderate size, black nearly or quite flat except IV on abdominal segment 8, IV and V much larger than the more dorsal tubercles, tubercles II fused across the dorsum on 9, sometimes including I. Cervical shield pale yellow with narrow black margins. Anal shield brownish with broad black anterior margin, posterior margin not modified the setae on posterior rather than dorsal margin. Head pale yellow with a dark area in the curve of the ocelli.

Described from 1 mature and 1 immature inflated larva: "Rye, N. Y., Ex *Tripsacum dactyloides*, H. Bird," immature specimen dated V.29.1912. Bird (3) gives his usual interesting account of the habits of this larva.

*Distribution*.—Douglas County, Kans., and Rye, N. Y.

*Food plants*.—Gamagrass (*Tripsacum dactyloides*).

#### APAMEA KIEFERI Benj.

Head 3.1 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin obscurely pavement-granulose; general color whitish with dull purplish longitudinal stripes.

Body whitish throughout except as indicated. A dull purplish stripe with setigerous tubercle I at center and II at lateral margin. A purplish stripe in-

cluding III and the spiracles. Spiracles dark brown. No subventral stripe differentiated. Setigerous tubercles large, flat, black with IV much the largest and variable in position on abdominal segment 7 where it may be directly posterior to the spiracle or in the usual postero-ventral position, II not fused across the dorsum and I, II and III not fused on abdominal segment 9. Cervical shield pale brown with black anterior margin. Anal shield pale brown with narrow black anterior margin; not modified posteriorly. Head brown, unmarked.

Described from numerous larvae collected near Tieton, Wash., in July by Joseph Wilcox, Wm. W. Baker, S. E. Crumb, Jr., and the writer. Moths emerged in September, and were determined by Benjamin.

*Distribution.*—Washington, Oregon, California, and Utah.

*Food plant.*—Bores in the bulbous leaf bases and later in the extremely acrid rhizomes of *Iris missouriensis*. A larva taken boring in cultivated bulbous *Iris* at Boring, Oreg., by M. B. McKay was received through the kindness of Dr. Don C. Mote, and larvae have fed freely on German *Iris* in confinement.

### PARAPAMEA Bird

#### PARAPAMEA BUFFALOENSIS (Grt.)

Head 2.8 mm. broad. Body about 40 mm. long and 4.5 mm. broad at middle tapering slightly posteriorly; skin bearing small, somewhat isolated granules; general color whitish with subdued purplish longitudinal stripes, less evident in later instars and not obscured or broken on anterior abdominal segments.

A pale middorsal line. A purplish stripe including setigerous tubercles I and II. A pale stripe between II and III. A purplish area including III in dorsal margin and extending to base of prolegs. Midventer tinged with purplish. Spiracles black. Setigerous tubercles large, nearly flat, black, I larger than II on anterior abdominal segments, IV often smaller than V on segments posterior to 2, I, II, and III fused across the dorsum on abdominal segment 9. Cervical shield brown with black lateral margins. Anal shield infuscated brown, long, the posterior margin not modified, posterior setae on dorsal margin. Head brown, unmarked except black about the ocelli, mandible with a large molar area dorsally on cutting edge and bearing but one seta.

Described from 8 alcoholic and 1 inflated larvae collected in New Jersey in August by Charles Rummel.

*Distribution.*—Delaware, New Jersey, Pennsylvania, and New York.

*Food plant.*—Bores in the roots of lizardtail (*Saururus cernuus*).

### PAPAPEMA Sm.

#### EMBOLOECIA Hamp.

*Emboloecia sauzalitae* (Grt.) is a *Papaipema* in all characters and is treated as such in the following discussion and key.

Although all markings may be lost in later instars in some species, one fundamental pattern prevails in at least the earlier instars consisting of pale middorsal, subdorsal, and subventral stripes on a purplish or pinkish ground with an intensification of the ground color on the first four abdominal segments where the subdorsal stripe alone, or both the middorsal and subdorsal stripes, may be obliterated, or both stripes may continue uninterruptedly. The presence or absence of these various stripes on the anterior abdominal segments are characters of prime importance in grouping the species as was worked out long ago by that old master of papaipemology, Mr. Henry Bird.

In all species the skin bears minute, somewhat isolated granules, and the setigerous tubercles are mostly large, nearly or quite flat, and usually black, although sometimes brown. The head varies in color among the species from yellow and yellowish brown to a decided brown and there may be a dark line posterior to the ocelli. This line may be absent occasionally in any of the species in which it is normally present and is always absent in some species.

The cervical shield is of a somewhat paler shade than that of the head, with black lateral margins which are seldom absent, and seems to offer but little of value in distinguishing species. The color of the median portion of the anal shield usually varies among the species through yellow, yellowish brown, and brown, but is infuscated brown in *circumlucens* and *Emboloccia sauzalitae*, blackish in *berriana*, and black in *cerussata* and *furcata*. The lateral margins of the anal shield are normally shaded with black.

Most of the structural characters usually employed in separating species either are uniform throughout or are too variable to be of service in this genus but the species may be divided into two fairly well-defined sections based on the relation of the width of the spiracle to its height. In one section the usual width is equal to 45 to 55 percent of the height, while in the other the usual width is equal to 60 to 65 percent of the height with occasional specimens, in both categories, varying upward or downward, respectively, to close the gap between the two sections. In spite of this variability, this character should provide positive evidence as to the group in which a species belongs where several specimens are available for measurement.

Some species such as *nebris*, *cataphracta*, and *Emboloccia sauzalitae* are more or less general feeders, but most of the species are restricted in their choice of food to a single species of plant or to a closely related group of plants. It should be noted, however, that many of those showing a restricted food preference will attack adjacent plants of various kinds when the supply of the preferred host plant runs low.

The strong food preference naturally has a highly important bearing on the distribution of the various species, but the range of the host is often much greater than the known distribution of the moths. This is probably due, in part, to the fact that the moths of some species fly but little and are seldom encountered except through rearing.

1. Subdorsal pale stripe present on anterior abdominal segments in all instars. Usual width of spiracle on abdominal segment 2 equal to 45 to 55 percent of the height. Setigerous tubercles III and III\* usually fused on abdominal segment 8.----- 2
- Subdorsal pale stripe absent on anterior abdominal segments in all instars. Proportions of the spiracle various.----- 4
2. Setigerous tubercle I touching the middorsal pale stripe on abdominal segment 1, with the transverse width of this tubercle greater than that of IV on this segment.----- 3
- Setigerous tubercle I well removed from the margin of the middorsal pale stripe with the transverse width of this tubercle much less than that of IV on abdominal segment 1. Head brown. Bores in lilies and some other monocotyledonous plants.----- *cerina*
3. Head yellowish. Setigerous tubercles black. In various plants.----- *cataphracta*  
Head and setigerous tubercles brown. In goldenrod (*Solidago*)----- *duovata*
4. Middorsal pale stripe continuous across anterior abdominal segments, at least in earlier instars. All markings may disappear in later instars. Dark line posterior to the ocelli usually present. Anal shield brown or yellowish except blackish in *berriana*.----- 5
- Middorsal pale stripe obliterated on anterior abdominal segments in all but the first instar. Dark line posterior to the ocelli absent except in *cerussata* in which the anal shield is black.----- 18

5. Usual width of spiracle on abdominal segment 2 equal to 50 to 55 percent of the height or less but varying higher in occasional specimens. Setigerous tubercles III and III\* often fused on abdominal segment 8. Food plants not belonging to the Compositae except in *polymniac* and sometimes in *nebris*. Distribution limited to areas east of the Rocky Mountains except that *circumlucens* is also reported from Utah and California..... 6
- Usual width of spiracle on abdominal segment 2 equal to 60 to 65 percent of the height or more but varying downward to 57 percent in occasional specimens and usually lower in *sauzalitac*. Setigerous tubercles III and III\* seldom fused on abdominal segment 8 except in *sauzalitac*. Food plants confined to the Compositae except in two Pacific coast species (*pertincta* and *sauzalitac*) and in *marginidens*..... 11
6. Setigerous tubercles of each side completely fused across the dorsum on abdominal segment 9, the plate thus formed not at all invaded by the pale middorsal stripe. In brake (*Pteris aquilina*)..... *pterisii*
- Setigerous tubercles not completely fused across the dorsum on abdominal segment 9, divided at least partially by the middorsal pale stripe..... 7
7. Transverse width of setigerous tubercle I on abdominal segment 1, less, usually much less, than the transverse width of IV on this segment. A small, slender larva with head but 2 mm. broad at maturity. In Whorled Loosestrife (*Lysimachia quadrifolia*)..... *lysimachiae*
- Transverse width of setigerous tubercle I on abdominal segment 1 at least nearly equal to that of IV on this segment. Larger species with head at least approximately 3 mm. broad at maturity..... 8
8. Head 2.8 to 3.2 mm. broad at maturity. Crochets on prolegs brown with their apices darker. Anal shield yellowish to pale brown. In a great variety of plants..... *nebris*
- Head 3.2 to 3.6 mm. broad at maturity..... 9
9. Crochets on prolegs brown. Anal shield pale brown. In *Polymnia uvedalia*..... *polymniac*
- Crochets on prolegs black..... 10
10. Anal shield infuscated brown. In *Apocynum* and *Psoralea*..... *circumlucens*
- Anal shield yellowish brown. In *Podophyllum*..... *merrickato*
11. Known distribution confined to areas west of the Rocky Mountains..... 12
- Known distribution confined to areas east of the Rocky Mountains..... 14
12. Usual width of spiracle on abdominal segment 2 equal to 54 to 57 percent of the height. Setigerous tubercles III and III\* fused on abdominal segment 8. Anal shield infuscated brown. Head 2.7 to 3 mm. broad in mature larva. In a variety of plants..... *Embolocia sauzalitac*
- Usual width of spiracle on abdominal segment 2 equal to 61 to 68 percent of the height. Setigerous tubercles III and III\* seldom fused on abdominal segment 8. Anal shield brown or yellowish brown. Head 3.1 to 3.5 mm. broad in mature larva..... 13
13. Hind coxae one-sixth the femur width apart or less. In *Senecio*..... *insulidens*
- Hind coxae one-fourth the femur width apart or more. In *Lupinus polyphyllus*..... *pertincta*
14. Anal shield blackish. Each anterior proleg with nine crochets in the one specimen seen. In *Lacinuria pycnostachya*..... *beeriana*
- Anal shield brown or yellowish..... 15
15. Each anterior proleg with 7 crochets in the 1 specimen seen. In *Eupatorium purpurcum*..... *eupatorii*
- Each anterior proleg with 11 to 16 crochets in later instars..... 16
16. Head decidedly brown and without the dark line posterior to the ocelli. In *Aster* and *Helenium autumnale*..... *impeccuosus*
- Head brownish yellow with the dark line usually present posterior to the ocelli..... 17
17. In burdock (*Arctium*), thistles (*Cirsium*) and teasel (*Dipsacus*).  
 In Umbelliferae (*Cicuta*, etc.)..... *arctivorens*  
*marginidens*
18. Spiracles very broad, the width on abdominal segment 2 equal to from 62 to 76 percent of the height. Anal shield infuscated brown. Setigerous tubercles I and II on each side on abdominal segment 9 sometimes well separated, sometimes fused, and the plates thus formed sometimes fused across the dorsum. In *Rudbeckia laciniata*..... *nelita*
- Spiracles distinctly narrower, the width on abdominal segment 2 equal to from 45 to 58 percent of the height. Anal shield pale brown or black... 19

19. Setigerous tubercles I and II on abdominal segment 9 free, well separated, with tubercles II separated middorsally by the middorsal pale stripe. In meadow-rue (*Thalictrum*)----- *frigida*  
 Setigerous tubercles I and II of each side fused to form one sclerotized area on abdominal segment 9, and two often fused across the dorsum and not at all invaded by the middorsal pale stripe----- 20
20. Anal shield pale brown----- 21  
 Anal shield black----- 22
21. In *Veronica virginica*----- *scitata*  
 In *Helianthus giganteus* and *H. lactiflorus*----- *maritima*  
 Dark line absent posterior to the ocelli. In twigs of ash trees (*Fraxinus*)  
*cerussata*  
 Dark line absent posterior to the ocelli. In twigs of ash trees (*Fraxinus*)  
*furcata*

## PAPAIPEMA CERINA (Grt.)

Head 2.6 to 3 mm. broad. Body about 30 mm. long and 4 mm. broad at middle.

Four larvae examined, all from A. K. Wyatt: 1 larva labeled "In grass. Fed on Iris. Chicago, Ill., VII.3.35"; 3 larvae, "Bred on *Lilium umbellatum*, Chicago, Ill., X.10.36."

*Distribution*.—Maine, New York, New Jersey, and Illinois.

*Food plants*.—Lilies (*Lilium superbum* and *L. umbellatum*) and mandrake or Mayapple (*Podophyllum peltatum*).

## PAPAIPEMA CATAPHRACTA (Grt.)

Head 3.3 mm. broad. Body about 32 mm. long and 4.5 mm. broad at middle.

Seven specimens examined: 5 larvae from Chas. Rummel in New Jersey; 1 larva from Henry Bird labeled "Rye, N. Y., July 25, 1929," and 1 specimen collected VII.18.29 boring in Dahlia by Wm. W. Baker on the grounds of a commercial grower of ornamental plants at Puyallup, Wash., and, in all probability, brought in on plant material from the East.

*Distribution*.—United States: New York, New Jersey, Michigan, Pennsylvania, Wisconsin, Minnesota, and Massachusetts. Canada: Ontario.

*Food plants*.—A very general feeder.

## PAPAIPEMA DUOVATA (Bird)

Head 3 to 3.4 mm. broad. Body about 30 mm. long and 4 mm. broad at middle.

Two larvae examined, both from Henry Bird, labeled "H. Bird, Rye, N. Y., July 25, 1935."

*Distribution*.—New York and Maryland.

*Food plant*.—Goldenrod (*Solidago sempervirens*) (teste Bird).

## PAPAIPEMA PTERISII Bird

Head 3 mm. broad. Body about 32 mm. long and 4.5 mm. broad at middle.

One specimen examined labeled "Papaipema pterisii, mature, H. Bird, Rye, N. Y., July 30, 1935."

*Distribution*.—United States: Maine, New York, Massachusetts, Connecticut, New Jersey, Pennsylvania, Iowa, and Colorado. Canada: Ontario and Quebec.

*Food plant*.—Brake (*Pteris aquilina*) (teste Bird).

## PAPAPEMA LYSIMACHIAE Bird

Head 2 to 2.1 mm. broad. Body about 30 mm. long and 3.5 mm. broad at middle.

Fourteen specimens examined, including 13 alcoholic larvae from Chas. Rummel in New Jersey and 1 alcoholic larva from Henry Bird labeled "Papaipema lysimachiae, mature, H. Bird, Rye, N. Y., Aug. 7, 1935."

*Distribution*.—Maine, New York, New Jersey, Pennsylvania, North Carolina, and Minnesota.

*Food plant*.—Whorled loosestrife (*Lysimachia quadrifolia*) (teste Bird).

## PAPAPEMA NEBRIS (Gr.)

Head 2.8 to 3.2 mm. broad. Body about 27 mm. long and 4.5 mm. broad.

Decker (22) gives a detailed account of the life history, habits, distribution, and food plants of this species. Many live larvae examined in June and July at Clarksville, Tenn., boring in stems of giant ragweed (*Ambrosia trifida*). Moths determined by Dyar.

*Distribution*.—Generally distributed over the United States east of the Rocky Mountains and in the adjacent Provinces of Canada.

*Food plants*.—Probably prefers giant ragweed (*Ambrosia trifida*), but readily attacks a very wide range of plants. Decker (*loc. cit.*) lists 129 species representing 44 families among the food plants of this larva in Iowa.

## PAPAPEMA POLYMNIAE Bird

Head 3.2 to 3.6 mm. broad. Body about 40 mm. long and 5 mm. broad at middle.

Fourteen larvae examined and many others seen, including 3 specimens from Henry Bird labeled "Papaipema polymniae, ex Polymnia, Virginia, H. Bird, July 26, 1929" and numerous specimens collected by the writer from *Polymnia uvedalia*, July 17, 1929 near Clarksville, Tenn., from which moths were reared, and determined by Bird as *polymniae*.

*Distribution*.—New York, New Jersey, Maryland, District of Columbia, Virginia, North Carolina, and Tennessee.

*Food plant*.—*Polymnia uvedalia*.

## PAPAPEMA CIRCUMLUCENS (Sm.)

Head 3.4 to 3.6 mm. broad. Body about 40 mm. long and 6 mm. broad at middle.

Ten alcoholic specimens examined, including 3 larvae from A. K. Wyatt labeled "Chicago, Ill., VIII.20.1933. In *Apocynum androsaemifolium* and seven from H. H. Keifer labeled "Sacramento, Calif., VIII.25.1933. In *Psoralea macrostachya*." The latter specimens are associated with a reared moth now in the National Museum which was determined by Clarke.

*Distribution*.—United States: New York, Pennsylvania, New Jersey, Illinois, Kansas, Nebraska, Utah, and California. Canada: Quebec.

*Food plants*.—Dogbane (*Apocynum androsaemifolium*), *Psoralea macrostachya*, and at least occasional in *Mesadenia tuberosa* and *Vernonia fasciculata* (teste Bird).

## PAPAIPEMA MERRICKATA Bird

Head 3.3 mm. broad. Body about 37 mm. long and 5.5 mm. broad at middle.

Two alcoholic larvae examined: "*Papaipema merrickata*, Chicago, Ill., in mandrake roots, VII.31.1938, A. K. Wyatt."

*Distribution*.—New York, Pennsylvania, Maryland, and Illinois.

*Food plant*.—Mandrake or mayapple (*Podophyllum peltatum*).

## EMBOLOECIA SAUZALITAE (Grt.)

Head 2.7 to 3 mm. broad. Body about 35 mm. long and 4 mm. broad at middle.

Seven larvae examined: 6 collected by the writer VII.11.39 near Alderton in western Washington from burdock and thistle associated with a reared moth determined by Henry Bird, and 1 alcoholic specimen from the U. S. National Museum labeled "Ex *Lilium philippinense*, San Francisco, Calif. 10.VII.1942, Lot 42, T. C. 8579."

*Distribution*.—Washington, Oregon, and California.

*Food plants*.—Lange (30) records several species of thistle (*Cirsium*), globe artichoke (*Cynara scolymus*), painted cup (*Castilleja latifolia*), curly dock (*Rumex crispus*), and corn as food plants of this species. C. F. Doucette has taken the larva in lilies in Washington, Oregon, and California, and the writer has reared this species from burdock (*Arctium lappa*).

## PAPAIPEMA INSULIDENS (Bird)

Head 3.2 to 3.5 mm. broad. Body about 30 mm. long and 4 mm. broad.

Six larvae have been examined and others reared, all collected boring in *Senecio serra* during June 1933 at Pullman, Wash., by J. F. Gates Clarke. Three moths reared from these emerged August 6–10, 1933, and are now in the National Museum. Moths determined by Benjamin.

*Distribution*.—United States: Washington and California. Canada: Vancouver Island (B. C.).

*Food plants*.—*Senecio hydrophyllus* and *Senecio serra*.

## PAPAIPEMA PERTINCTA Dyar

Head 3.1 to 3.3 mm. broad. Body about 35 mm. long and 5 mm. broad at middle.

Many live larvae seen. Reared moths determined by Henry Bird.

*Distribution*.—Oregon and Washington.

*Food plants*.—*Lupinus polyphyllus* and *Petasites speciosa*.

## PAPAIPEMA BEERIANA Bird

Head 3.3 mm. broad. Body about 32 mm. long and 5 mm. broad at middle.

One specimen from A. K. Wyatt labeled "*Papaipema beeriana*, In *Lacinaria pycnostachya*, Chicago, Ill., VIII.1.1938."

*Distribution*.—Known only from Illinois, but probably of considerably wider distribution.

*Food plant*.—*Lacinaria pycnostachya*.

## PAPAIPEMA EUPATORII (Lyman)

Head 2.7 mm. broad. Body about 35 mm. long and 5 mm. broad. Probably immature.

One specimen from A. K. Wyatt labeled "Papaipema eupatorii, In *Eupatorium purpureum*, Chicago, Ill., VIII.11.1935."

*Distribution*.—United States: New York, Pennsylvania, and Illinois. Canada: Ontario and Quebec.

*Food plant*.—Joe-pye-weed (*Eupatorium purpureum*).

#### PAPAIPEMA IMPECUNIOSA (Grt.)

Head 2.4 to 2.7 mm. broad. Body about 30 mm. long and 3.5 mm. broad at middle. Probably immature.

Four specimens examined, all from Chas. Rummel in New Jersey.

*Distribution*.—United States: Maine, New York, Massachusetts, New Jersey, Pennsylvania, and Illinois. Canada: Ontario.

*Food plants*.—*Aster umbellatus*, *Aster puniceus*, and *Helenium autumnale* (teste Bird).

#### PAPAIPEMA ARCTIVORENS Hamp.

Head 3.2 mm. broad. Body about 35 mm. long and 5.5 mm. broad at middle.

The one specimen seen came from A. K. Wyatt and was collected at Chicago, Ill., VIII.14.1937, in a thistle (*Cirsium discolor*).

*Distribution*.—United States: New York, Illinois, Iowa, and Minnesota. Canada: Quebec.

*Food plants*.—Thistle (*Cirsium* spp.), Burdock (*Arctium lappa*), and teasel (*Dipsacus sylvestris*) (teste Bird).

#### PAPAIPEMA MARGINIDENS (Gn.)

Head 3.6 mm. broad. Body about 32 mm. long and 4.5 mm. broad at middle.

All of the five larvae seen are from Chas. Rummel in New Jersey.

*Distribution*.—United States: Maine, New York, Massachusetts, New Jersey, Pennsylvania, Maryland, Illinois, Minnesota, and Wisconsin. Canada: Quebec and Alberta.

*Food plants*.—Water hemlock (*Cicuta maculata*) and other large Umbelliferae (teste Bird).

#### PAPAIPEMA NELITA (Stkr.)

Head 3 to 3.1 mm. broad. Body about 30 mm. long and 5 mm. broad at middle.

The four larvae seen were collected by A. K. Wyatt at Chicago, Ill., VII.20.1937, in *Rudbeckia laciniata*.

*Distribution*.—New York, Pennsylvania, Delaware, North Carolina, and Illinois.

*Food plant*.—Tall coneflower (*Rudbeckia laciniata*).

#### PAPAIPEMA FRIGIDA (Sm.)

Head 2.9 to 3.1 mm. broad. Body about 30 mm. long and 5 mm. broad at middle.

The two larvae seen were furnished by Henry Bird and are labeled "Papaipema frigida, mature, Rye, N. Y., Aug. 1, 1929."

*Distribution*.—United States: Maine, New York, Indiana, and Illinois. Canada: Alberta, Manitoba, Ontario, Quebec, Nova Scotia, and Newfoundland.

*Food plant*.—Meadowrue (*Thalictrum polygamum*).

## PAPAPEMA SCIATA Bird

Head 2.4 to 2.6 mm. broad. Body about 30 mm. long and 4 mm. broad at middle. Immature.

Of the 3 specimens seen, 1, marked "penultimate stage," was collected by Henry Bird at Rye, N. Y., July 25, 1911, from speedwell, while 2 are from A. K. Wyatt and were collected at North Riverside, Ill., IX.5.1937, in *Veronicastrum virginicum*.

*Distribution*.—New York, New Jersey, Illinois, and Minnesota.

*Food plant*.—Culversphysic or speedwell (*Veronica virginica*).

## PAPAPEMA MARITIMA Bird

Head 2.6 to 2.7 mm. broad. Body about 35 mm. long and 5.5 mm. broad at middle.

Of the 5 specimens seen, 2 marked "mature" are from Henry Bird and were collected at Rye, N. Y., August 3, 1935, while 3 others are from A. K. Wyatt and were collected at Chicago, Ill., VIII.14.37, in *Helianthus laetiflorus*.

*Distribution*.—New York, Pennsylvania, Illinois, and Kansas.

*Food plants*.—*Helianthus giganteus* (teste Bird) and *Helianthus laetiflorus* (teste Wyatt).

## PAPAPEMA CERUSSATA (Grt.)

Head 4 to 4.4 mm. broad. Body about 43 mm. long and 6 mm. broad at middle.

Many live larvae have been collected from roots of *Vernonia* in June and July at Clarksville, Tenn., and Chas. Rummel has sent specimens from New Jersey. Moths reared from the Tennessee larvae were determined by Bird.

*Distribution*.—Maine, New York, Connecticut, Pennsylvania, New Jersey, Virginia, North Carolina, Tennessee, Missouri, Illinois, and Iowa. Canada: Manitoba and Ontario.

*Food plant*.—Ironweed (*Vernonia noveboracensis*).

## PAPAPEMA FURCATA (Sm.)

Head 2.6 to 2.7 mm. broad. Body 30 mm. long and 4.5 mm. broad at middle. Specimens immature.

Both of the two larvae seen were collected by Henry Bird. One of these marked "penultimate stage" was collected at Washington, D. C., August 10, 1929, from boxelder (*Acer negundo*), while the second was taken at the same locality and on the same food plant July 29, 1929.

*Distribution*.—New Hampshire, New York, Pennsylvania, New Jersey, Maryland, District of Columbia, Illinois, Iowa, and Minnesota.

*Food plants*.—Twigs of ash trees (*Fraxinus* spp.) and at least occasionally in boxelder (*Acer negundo*).

## ARZAMA WIK.

## ARZAMA OBLIQUA (Wik.)

Head 3.8 to 4.1 mm. broad. Body about 45 mm. long and 7 mm. broad at middle, tapering somewhat posteriorly; skin intricately rugulose; general dorsal color dusky, sometimes tinged with brownish.

Body to well ventrad of the spiracles dusky, without markings, venter waxy white. Spiracles deep brown, appearing black, extremely narrow, set transversely on posterior margin of the dorsum on abdominal segment 8. Cervical shield apparently varying from brown to black, with pale anterior margin. Anal shield brown or infuscated brown with somewhat elevated rim, at least laterally, and sometimes slightly crenulate or lobed posteriorly, the posterior setae on dorsal margin. Setigerous tubercles minute, two tubercles of the VII group present on abdominal segment 7. Head deep brown or black, unmarked except that dark freckles are sometimes visible.

Described from numerous larvae from New York, Maryland, Indiana, Virginia, and Washington. Moths emerged from the Washington material in March and April and were determined tentatively as *obliqua* by Benjamin. Mr. Benjamin was not able to satisfy himself entirely that the Washington moths were not *gargantua* Dyar but careful comparison of Washington larvae with those from the East has failed to disclose any differences which seem to be significant. The larvae mature in the fall and overwinter in cells in cattail stems, in the soil or under loose bark, pupating early in the spring.

*Distribution*.—United States: Washington, Idaho, Montana, Utah, Colorado, Nebraska, Minnesota, Florida, South Carolina, North Carolina, Virginia, Maryland, Indiana, Ohio, Pennsylvania, New Jersey, New York, and Massachusetts. Canada: Quebec, Ontario, Saskatchewan, and British Columbia.

*Food plants*.—Bores in stems of cattail (*Typha*).

#### MACRONOCTUA Grt.

#### MACRONOCTUA ONUSTA Grt.

Head 4.2 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, tapering posteriorly; skin obscurely pavement-granulose; general dorsal color pink, otherwise whitish.

Body without markings. Spiracles long and extremely narrow, brown. Setigerous tubercles large, brown, I and II flat, remaining dorsal tubercles to VI convex, tubercles II fused across the dorsum on abdominal segment 9. Cervical shield brown with black anterior and lateral margins. Anal shield pale brown, not modified posteriorly except that the setae are on the posterior rather than the dorsal margin. Anterior coxae free and somewhat separated. Head dark reddish brown without markings.

Described from 2 mature and 3 immature alcoholic larvae collected at Lexington, Ky., July 26, 1920, by H. Garman, and 3 mature larvae from Maine Agricultural Experiment Station through J. H. Hawkins.

*Distribution*.—United States: Iowa, Illinois, Minnesota, Indiana, Ohio, Kentucky, Pennsylvania, New Jersey, New York, Connecticut, Massachusetts, and Maine. Canada: Quebec.

*Food plants*.—Bores in rhizomes of *Iris*, occasionally in lilies, and blackberry lily (*Gemmingia*).

#### ACHATODES Gr.

#### ACHATODES ZEAE (Harr.)

Head 2.7 to 3 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, abdominal segments of about equal width to 8; skin smooth; general color white with head and setigerous tubercles black.

Body white without markings. Spiracles broad, brown, the sieve plate distinctly sclerotized laterally (pl. 10, Q). Setigerous tubercles large, slightly convex, black, I and II on one plate fused across the dorsum on abdominal seg-

ment 9, IV directly posterior to the spiracle on 7. Cervical shield black. Anal shield black, strongly rugulose, posterior margin somewhat elevated with six upright subconical projections on dorsal margin, the posterior setae on posterior edge. Head black, unmarked.

Described from numerous larvae collected in Tennessee in April by K. B. McKinney and the writer. Moths emerged in May and June, and were determined by Dyar. Silver (38) has published a full, illustrated account of this species.

*Distribution.*—Occurs generally east of the Mississippi River from Louisiana and Florida to Iowa, Minnesota, Wisconsin, and Maine.

*Food plants.*—Bores in new growth of elder (*Sambucus*); occasionally in dahlia, corn, and grasses.

### Subfamily PLUSINAE

Excluding the genus *Abrostola*, the species included here may be grouped in nine clearly defined genera based, primarily, on secular changes affecting the ventral setigerous tubercles (VII group and VIII).

In contrast with the larval findings, Dr. McDunnough (33) has divided these species into 13 genera on adult characters. This might be interpreted as indicating that the adult characters in this subfamily provide more sensitive indices of change than are found in the larvae. It should be noted, however, that the genus *Autographa*, as established on adult characters, is shown to be heterogeneous on larval characters and the same seems to be true in *Syngrapha*.

In *Autographa* only *biloba*, *precatiosis*, and *californica*, of the species included here, agree with the larva of the type (*gamma* Linn.), while *ampla*, *corusca*, and *mappa* fall into that section of the subfamily including *Anographa* and *Syngrapha* and are placed under *Syngrapha* although their status in this group must remain uncertain until more material in *Syngrapha* proper is available for study. Owing to the highly unusual bisetose condition of setigerous tubercle VI on the mesothorax and metathorax, it has seemed advisable to segregate the conifer-feeding species now placed under *Syngrapha* as a distinct genus.

The writer has the greatest respect for the work of Dr. McDunnough in the Phalaenidae, and the above is written, not as an adverse criticism, but as an evaluation of relationships from a new angle of approach.

- |  |                                |
|--|--------------------------------|
| 1. Prolegs present on abdominal segments 3 and 4. With a tooth on oral face of mandible arising from the second rib..... | <i>Abrostola</i> <sup>22</sup> |
| Prolegs absent on abdominal segments 3 and 4. Mandible without a tooth or process on oral face.....                      | 2                              |

<sup>22</sup>Dr. John A. Comstock has described and figured the larva of *Mouralia tinoides* Gn. (A New Record and a Life History (Lepidoptera)). Bul. South. Calif. Acad. Sci. v. 35, p. 3, p. 169, issued January 31, 1937.

All of the normal complement of prolegs are present and the color pattern is very similar to that of *Abrostola*. The *Mouralia* larva feeds on Wandering Jew (*Tradescantia fluminensis* Vell.) and is reported from California, Florida, and Texas only while the larva of *Abrostola* feeds on stinging nettle (*Urtica*) and is of much wider distribution.

2. Setigerous tubercle VII<sup>c</sup> present on abdominal segment 1 and confluent (fused) with VII<sup>b</sup> on segments 1 to 4. Vestigial prolegs absent and VIII migrated conspicuously toward the midventral line on abdominal segments 3 and 4. Head without a black line or stripe at the ocelli..... 7  
 Setigerous tubercle VI<sup>a</sup> absent on abdominal segment 1 (pl. 4, E). Head often with a black line or stripe at the ocelli, but this is variable..... 3
3. Vestigial prolegs present on abdominal segments 3 and 4 (pl. 4, F). Setigerous tubercles VII<sup>b</sup>, VII<sup>c</sup>, and VIII grouped closely about base of proleg on these segments. Seta III on abdominal segment 9 slender, threadlike. No fused tubercles on abdominal segment 2.  
*Trichoplusia, Argyrogramma, Pseudoplusia*  
 Vestigial prolegs absent on abdominal segments 3 and 4. Setigerous tubercles VII<sup>b</sup> and VII<sup>c</sup> confluent (fused) and VIII migrated conspicuously toward the midventral line on these segments. Seta III smaller but otherwise similar to adjacent setae on abdominal segment 9..... 4
4. Setigerous tubercles VII<sup>b</sup> and VII<sup>c</sup> clearly well separated on abdominal segment 2..... 5  
 Setigerous tubercles VII<sup>b</sup> and VII<sup>c</sup> confluent (fused) on abdominal segment 2..... 6
5. Setae VIII on abdominal segment 4 at most but slightly nearer to each other than to seta VII<sup>b</sup> (21:25)..... *Autoplusia, Rachiplusia*  
 Setae VIII on abdominal segment 4 twice as near to each other as to seta VII<sup>b</sup> (9:20)..... *Plusia, Agrapha*
6. Setigerous tubercles VII<sup>a</sup>, VII<sup>b</sup>, and VII<sup>c</sup> confluent (fused) on abdominal segment 2. Setae VIII on abdominal segment 4 as far from each other as from seta VII<sup>b</sup>..... *Polychrysis*  
 Setigerous tubercle VII<sup>a</sup> clearly well separated from VII<sup>b</sup> and VII<sup>c</sup> on abdominal segment 2. Setae VIII on abdominal segment 4 much nearer to each other than to seta VII<sup>b</sup> (15:24)..... *Autographa*
7. Setigerous tubercle VI with two setae on each thoracic segment. Feed exclusively on coniferous trees..... Genus No. 11  
 Setigerous tubercle VI with 2 setae on prothorax and but 1 seta on each remaining thoracic segment. Do not feed on coniferous trees..... 8
8. Oral face of mandible with a curved, elevated rim extending from ventral edge of cutting margin nearly to base (pl. 5, L). Setigerous tubercles A<sup>1</sup>, A<sup>2</sup>, and A<sup>3</sup> forming a right angle at A<sup>2</sup>..... *Chrysoptidia*  
 Mandible not as above. Setigerous tubercles A<sup>1</sup>, A<sup>2</sup>, and A<sup>3</sup> forming an obtuse angle at A<sup>2</sup>..... 9
9. The line of setigerous tubercles P<sup>1</sup> at apex of front. Setigerous tubercle IV directly posterior to middle of spiracle on abdominal segments 2 to 4. General dorsal color blackish with but one strong, white middorsal line.  
*Oatoplusia*  
 Line of setigerous tubercles P<sup>1</sup> well above apex of front. Setigerous tubercle IV postero-ventrad of the spiracle on abdominal segments 2 to 4. General dorsal color green with a geminate, white middorsal line or with none.  
*Syngrapha, Anagrapha*

### ABROSTOLA Ochs.

- With a conspicuous white spot including setigerous tubercle II on abdominal segments 1 and 2. Of very limited distribution..... *ovalis*  
 Setigerous tubercle II at posterior end of a narrow pale area on abdominal segments 1 and 2. Much more widely distributed..... *urentis*

### ABROSTOLA OVALIS Gn.

Head 2.3 mm. broad. Body about 32 mm. long and 3.7 mm. broad at middle, tapering somewhat posteriorly with a dorsal hump on 8; skin smooth; general color pale, irregularly reticulate with infuscated reddish.

With a conspicuous white spot including and anterior to setigerous tubercle II on abdominal segments 1 and 2, the shield-shaped dorsal figures not distinct on these segments. Abdominal segments following 2 with a reddish line arising subdorsally at anterior margin, extending obliquely between I and II to near the posterior margin, thus outlining a segmental series of shield-shaped figures,

the enclosed area pale. A reddish line in the line of III. A white line dorsad of the spiracles. Spiracles pale or pale brown. Venter darker than the dorsum on abdominal segments 3 to 6 on which an oblique pale stripe extends upon the prolegs with V and VI in posterior margin. Two reddish midventral lines on I, 2, 7, and 8. Setigerous tubercles moderately large, II quite large on 8, white dorsally, dark ventrally with large white setal insertions. Head pale with black submedian arcs and reticulation.

Described from one alcoholic larva reared at Ithaca, N. Y., June-July 1941, by J. G. Franclemont.

*Distribution.*—New York, New Jersey, Massachusetts, and District of Columbia.

*Food plant.*—Stinging nettle (*Urtica*.)

#### ABROSTOLA URENTIS Gn.

Head 2 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering somewhat posteriorly with a strong dorsal hump on abdominal segment 8; skin smooth; general color varying from soft gray and soft greenish gray through pale green to dusky greenish.

Middorsal pale line absent except on thorax. A series of darker marks arising subdorsally near anterior margin of segments and convergent dorsally including setigerous tubercle I, outline a segmental series of shield-shaped figures, the enclosed area paler, margined laterally by a narrow pale area with II in posterior end. The shield-shaped figures less definite on abdominal segments 1 and 2 or replaced by a dark middorsal spot on these segments. A pale stripe dorsad of the spiracles, the ventral margin obscure. Spiracles white. A pale intersegmental area extending upon the prolegs with V and VI in a dark stripe at posterior margin. Setigerous tubercles of moderate size and but slightly elevated except I and II on 8 large and conical. Head green with black submedian arcs and reticulation.

Described from many larvae collected at Puyallup, Wash., in September. Larvae collected in September 1933 produced moths in January, February, March, and April, 1934, which were determined by Benjamin.

*Distribution.*—United States: California, Washington, Montana, Nebraska, Kansas, Minnesota, Ohio, Pennsylvania, New York, Connecticut, Massachusetts, and Vermont. Canada: Manitoba, Alberta, and British Columbia.

*Food plant.*—Stinging nettle (*Urtica*.)

#### TRICHOPLUSIA McD.

#### ARGYROGRAMMA Hbn.

#### PSEUDOPLUSIA McD.

1. Ribs of mandible continuing to cutting margin (pl. 6, N). Skin bearing extremely minute rounded granules. The minute annulus surrounding base of setae on head white or green (sometimes dark in immature larvae).

*Trichoplusia ni* Hbn. (*brassicae* Riley)

Two ventral ribs of mandible ending abruptly in a slight pocket (molar area) before reaching cutting margin (pl. 5, M). Skin bearing very minute spinules. The minute annulus surrounding base of setae on head usually black and often in small black spots.

2. All setigerous tubercles on body black..... *Pseudoplusia includens*  
Setigerous tubercle III usually black, other tubercles white or green, sometimes with black setal insertions..... 3
3. Setigerous tubercles small, nearly flat except dorsally on abdominal segment 8. Dark markings indistinct..... *Argyrogramma verruca*  
Setigerous tubercles small but distinctly subconical. A distinct dusky longitudinal shade including setigerous tubercle III. The geminate middorsal line including a dark green or blackish stripe..... *Trichoplusia oxygramma*

## TRICHOPLUSIA NI (Hbn.)

(var. BRASSICAE Riley)

Head 2 to 2.1 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, tapering somewhat posteriorly; skin bearing extremely minute rounded granules; general color green, the dorsum suffused with whitish.

A geminate, white middorsal line. A broad white line including setigerous tubercle I near the centre and II at ventral margin. A white line ventrad of II and a white stripe dorsad of the spiracles, sometimes less conspicuous on ventral margin. Spiracles pale with brown rim. Venter green. Setigerous tubercles moderately large and distinctly conical, white or green, III sometimes black. Head green or brownish green, without a black subocellar line or stripe, two ventral ribs of mandible extending to cutting margin.

Described from many larvae collected in June, July, and August. Moths emerged in July, August, and September, and were determined by Dyar and by McDunnough.

*Distribution.*—Occurs generally throughout the United States and in Canada.

*Food plants.*—Cabbage, lettuce, turnip, tomato, tobacco, parsnip, pea, and lambsquarters (*Chenopodium*).

## PSEUDOPPLUSIA INCLUDENS Wik. (oo Cram.)

(Teste W. T. M. Forbes)

Head 2.3 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, tapering posteriorly; skin bearing minute spinules; general color green.

A geminate, white middorsal line and traces of white lines ventrad of setigerous tubercle I, ventrad of II and dorsad of the spiracles. Spiracles white with brown rim. Venter green. Setigerous tubercles moderately large and distinctly conical, all black. Head grayish green, with a black line at the ocelli, setigerous tubercles black, two ventral ribs of mandible ending abruptly before reaching the cutting margin (pl. 5, M).

Described from four larvae collected at Clarksville, Tenn., in October. Moths emerged in November, and were determined by Dyar.

*Distribution.*—Kansas, Texas, Louisiana, Mississippi, Georgia, Florida, North Carolina, Tennessee, Pennsylvania, New York, Maine, Quebec, and southward into South America and the Hawaiian Islands.

*Food plants.*—Tobacco, alfalfa, beans, lettuce, collards, wandering-Jew (*Commelina*), *Croton capitatus*, and geranium.

## ARCTYGRAMMA VERRUCA (F.)

Head 2 mm. broad. Body about 27 mm. long and 4 mm. broad at middle, tapering posteriorly; skin bearing very minute, rounded granules; general color green.

A geminate white, middorsal line. A broader white line ventrad of and partially including setigerous tubercle I and another ventrad of II. A white line or stripe dorsad of the spiracles, tending to include the spiracles and fade out below. Spiracles white with brown rim. Venter green. Setigerous tubercles small, nearly flat except on abdominal segment 8, white or green except III, which is usually black. Head green, usually with a black subocellar line, setigerous tubercles dark, conspicuous; ventral ribs 2 and 3 of mandible terminating and strongly, rather abruptly, elevated near cutting margin (pl. 5, M).

Described from many larvae collected at Magnolia, Tenn., in October 1923 and at Clarksville, Tenn., in September 1920. Moths emerged in September, and were determined by Dyar.

*Distribution*.—Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, North Carolina, Tennessee, Maryland, New Jersey, Pennsylvania, New York, and southward into South America.

*Food plants*.—Arrowhead (*Sagittaria*), water willow (*Dianthera americana*), tobacco, cotton, and cowpea.

#### TRICHOPLUSIA OXYGRAMMA (Geyer)

Head 2 to 2.3 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin bearing very minute spinules; general color light green, tinged with whitish ventrally.

A geminate, white middorsal line enclosing a darker green or infuscated stripe and bent outward sharply on the posterior half of some abdominal segments. A slender white line between setigerous tubercles I and II and a broken, narrow, white line ventrad of II. The skin spinules are dark in a greenish fuscous longitudinal area including III, the dark area margined ventrally by a white band, sharply defined dorsally, including the spiracles and fading out ventrally. Spiracles yellowish or whitish with brown rim. Venter green, flecked with white. Setigerous tubercles small but distinctly conical, white or green except some on the thorax and III on the abdomen which may be black. Head green, a dark line usually present at the ocelli, dorsal setigerous tubercles black, ventral ribs 2 and 3 of mandible terminating and abruptly elevated apically before reaching the cutting margin (pl. 5, M).

Described from numerous larvae collected about Clarksville, Tenn., in August and September. Moths emerged in September and October, and were determined by Dyar.

*Distribution*.—Texas, Louisiana, Mississippi, Georgia, Florida, North Carolina, Virginia, Tennessee, Arkansas, Missouri, Kansas, Iowa, Illinois, Maryland, Pennsylvania, New York, New Hampshire, Maine, and southward into South America.

*Food plants*.—Eleusine (*Erigeron canadensis*), tobacco, aster, and goldenrod.

#### AUTOPLUSIA McD.

#### RACHIPLUSIA Hamp.

Setal insertions on head in small black spots. Ventral setigerous tubercles on abdominal segments 1 and 2 without a dark margin. ----- *Autoplusia egna*  
Setal insertions on head concolorous with head. Ventral setigerous tubercles on abdominal segments 1 and 2 outlined by a belt of dark spinules or granules  
*Rachiplusia ou*

#### AUTOPLUSIA EGNA (Gn.)

Head 2.3 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, broadening gradually posteriorly to abdominal segment 8, with a slight dorsal hump on 8; skin bearing minute spinules; general color dusky greenish.

A geminate middorsal pale line. A sinuate pale line ventrad of setigerous tubercle II bent downward strongly near the segmental incisures. A pale stripe including the spiracles and fading out ventrally. Color of spiracles not determinable but apparently not white. Setigerous tubercles I, II, and VI broadly subconical, remainder small and but slightly elevated; III black, other tubercles either black or concolorous with the skin, the ventral tubercles not outlined by a belt of dark spinules. Head green with small black spots at the setal insertions, sometimes otherwise unmarked but often conspicuously marked with black.

Described from 20 alcoholic larvae reared to maturity on bean leaves at Alhambra, Calif., in March 1933, and received through the kindness of J. C. Elmore.

*Distribution*.—California, Florida, and southward into South America.

*Food plant*.—Has been found attacking bean plants both in California and in Florida.

#### RACIPLUSIA OU (Gn.)

Head 2.3 to 2.7 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly; skin bearing minute spinules; general color pale green.

A geminate, white, middorsal line. A white line ventrad of setigerous tubercle I showing a distinct tendency to be expanded circularly about the tubercle and a white line, similarly disposed, ventrad of II. A white or yellowish stripe sharply defined both dorsally and ventrally and including only the dorsal apices of some of the anterior spiracles. Spiracles white with brown rim. Venter green, flecked with white. Setigerous tubercles of body moderately large, strongly elevated, white or green, the ventral tubercles outlined by minute black granules. Head green, setigerous tubercles not dark, ocellar black stripe including ocelli V and VI only.

Described from 10 larvae collected at Clarksville, Tenn., in June, July, and September; 2 alcoholic specimens reared by J. G. Franclemont in July 1941 at Ithaca, N. Y.; and two alcoholic specimens reared to maturity November 5, 1934, at Chicago, Ill., by A. K. Wyatt. Moths emerged in July and August, and were determined by Dyar.

*Distribution*.—California, Arizona, New Mexico, Texas, Louisiana, Mississippi, Georgia, Florida, North Carolina, Tennessee, Pennsylvania, New York, Illinois, Minnesota, Kansas, Nebraska, Colorado, and Montana.

*Food plants*.—Cosmos, tobacco, clover, and wormseed (*Chenopodium anthelminiticum*).

#### PLUSIA Ochs.

#### AGRAPHA Hbn.

Head with obscure coarse granules on occiput. The minute isolated skin granules armed with minute spinules.----- *Plusia aereoides*  
Head smooth. The minute skin granules without spinules.----- *Agrapha aerea*

#### PLUSIA AEREOIDES Grt.

Head measurement not recorded. Body about 30 mm. long and 5 mm. broad at middle, tapering very slightly posteriorly; skin bearing minute spinules; general color green.

A geminate, white, middorsal line. White line ventrad of setigerous tubercle I represented by an oblique line connecting I and II. A slender, white line ventrad of II. A white stripe dorsad of the spiracles, the ventral margin obscure. Spiracles yellowish white with pale brownish rim. Setigerous tubercles white except III dark, small, not strongly elevated, the ventral tubercles not margined by a belt of dark spinules or granules. Head pale green with obscure coarse granules on the occiput, no markings.

Described from one larva collected near Dieringer, Wash., September 21, 1932, when very immature. This larva was kept indoors and, after a period of lethargy lasting about a month, began to feed again and reached maturity the latter part of November. A moth emerged December 13, 1932, and was determined by Benjamin.

*Distribution.*—United States: Washington, Montana, California, Utah, Colorado, Minnesota, Pennsylvania, New York, New Hampshire, and Maine. Canada: Nova Scotia, Quebec, Ontario, Manitoba, Alberta, and British Columbia.

*Food plants.*—Mint (*Mentha canadensis*) and *Spiraea salicifolia* (teste Thaxter).

#### ACRAPHA AEREA (Hbn.)

This larva agrees structurally with that of *Plusia chrysitis* Linn.

Head 2.1 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, tapering very slightly posteriorly; skin bearing very small, rounded granules; general color green.

All markings removed by the preservative. Setigerous tubercles moderately large and distinctly elevated, particularly I and II on abdominal segment 8, apparently concolorous with adjacent parts. Head smooth, green, apparently unmarked and with concolorous setal insertions.

Described from two alcoholic larvae collected at River Grove, Cook County, Ill., July 15, 1939, by A. Herz, and received through A. K. Wyatt.

*Distribution.*—United States: Kansas, Mississippi, Georgia, North Carolina, Maryland, Pennsylvania, New Jersey, Ohio, Illinois, Minnesota, and New York. Canada: Ontario.

*Food plant.*—Stinging nettle (*Urtica*).

#### POLYCHRYSLIA Hbn.

#### POLYCHRYSLIA MONETA (F.)

Head 2.4 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, broadening gradually posteriorly to abdominal segment 8; skin bearing minute spinules; general color green.

A broad, geminate, white, middorsal line including setigerous tubercle I. A white line ventrad of II and a white stripe, sharply defined dorsally, including the spiracles and fading out ventrally. Venter green. Spiracles white. Setigerous tubercles small, gently convex, covered with spinules similar to those on the skin. Head color indeterminable, no black line or stripe at the ocelli.

Described from two inflated European larvae without data.

*Distribution.*—Alaska. Canada: Alberta and Ontario. Europe.

*Food plant.*—Larkspur (*Delphinium*) (teste MacNay).

#### AUTOGRAPHA Hbn.

1. Skin set dorsally with short, slender, pale hairs, darker and mixed with dark spinules ventrally. Ventral ribs on mandible extending to cutting margin

Skin set with small granules..... *biloba* 2

2. Two ventral ribs of mandible ending abruptly well before reaching cutting margin. Skin granules upright with a very small, conical point. Of eastern distribution..... *precautionis*

Two ventral ribs of mandible extending to cutting margin. Skin granules often linear, usually several times as long as wide, attached to the skin for their entire length. Of western distribution..... *californica*

#### AUTOGRAPHA BILOBA (Steph.)

Head 2.2 to 2.4 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, broadening posteriorly to abdominal segment 8; skin bearing fine short hairs, darker ventrally; general color green.

A geminate, white middorsal line, broken white lines ventrad of setigerous tubercle I and ventrad of II and a white line dorsad of the spiracles. Spiracles

white. Venter green. Setigerous tubercles green or white, moderately large, strongly elevated, III black in earlier instars. Claw of leg with the basal portion strongly angulate. Head green, with a strong black lateral stripe including all of the ocelli, the two ventral ribs of mandible gradually tapering out at the cutting margin.

Described from numerous larvae collected about Clarksville, Tenn., in May, June, and July, and two alcoholic larvae reared by J. G. Franclemont at Ithaca, N. Y., in July 1941. Moths have emerged in April, June, July, and August. Eggs deposited July 8, 1912, hatched July 12, two larvae pupated July 27, and a moth emerged August 5, 1912.

*Distribution.*—California, Arizona, Texas, Colorado, Kansas, Nebraska, Montana, Mississippi, Alabama, Florida, Georgia, North Carolina, Tennessee, Maryland, New Jersey, Pennsylvania, Illinois, New York, Massachusetts, and Maine.

*Food plants.*—Tobacco, lettuce (teste H. A. Allard), cabbage, and alfalfa (teste C. V. Piper).

#### AUTOCRAPHA PRECATIONIS (Gn.)

Head 2.1 to 2.3 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, broadening gradually posteriorly to abdominal segment 8; skin set closely with small, pointed, granules, black in overwintering larvae, pale in summer generation; general color dusky green with the white lines but faintly indicated in the overwintering larva, pale green with white lines distinct in summer generation.

A geminate, white, middorsal line; a white line including setigerous tubercle I and a narrow white line ventrad of II. The spiracles included in a white stripe, sharply defined dorsally and fading out ventrally. Spiracles yellow or white. Venter green. Setigerous tubercles rather large and strongly elevated, green except that III is sometimes black, ventral tubercles with a wide dark margin in overwintering larvae. Head and setigerous tubercles green, a very broad black stripe includes all of the ocelli and may extend posteriorly on occiput to the median line, ribs 2 and 3 of mandible terminating distinctly before reaching the cutting margin but not distinctly elevated apically.

Described from 3 larvae collected at Clarksville, Tenn., in March and April, and 4 larvae collected at Lexington, Ky., and Clarksville, Tenn., in July and August. A larva collected April 2, 1924, produced a moth April 22, 1924, which was determined by Schaus. Moths of summer generation determined by Dyar.

*Distribution.*—United States: Nebraska, Kansas, Minnesota, Wisconsin, Iowa, Illinois, Georgia, North Carolina, Tennessee, Kentucky, Virginia, Maryland, Ohio, Pennsylvania, New York, Connecticut, New Hampshire, Maine. Canada: Nova Scotia and Ontario.

*Food plants.*—A general feeder on herbs including: parsnip, bean, cabbage, hollyhock, *Verbena*, sunflower, thistle, dandelion, plantain, wild lettuce, and *Gerardia pedicularia*.

#### AUTOCRAPHA CALIFORNICA (Speyer)

Head 2.1 to 2.2 mm. broad. Body about 30 to 35 mm. long and 4.5 to 5 mm. broad at middle, broadening to abdominal segment 8; skin bearing linear granules, usually several times as long as wide, attached to the skin for their entire length; general color dusky green when the skin granules are black, pale green when granules are concolorous with body.

A geminate, white middorsal line often enclosing a dusky line intensified to black spots at anterior margin of segments. A broad white line including setigerous tubercle I and a slender white line ventrad of II. Area from ventrad of II to ventrad of III often occupied by a dusky band. A white or yellowish

stripe including the spiracles and fading out ventrally. Spiracles white. Setigerous tubercle III and ventral tubercles usually covered and outlined by dark granules. Head green or brownish green, sometimes with black freckles, the setal insertions dark but inconspicuous, normally with a black line or stripe at the ocelli which may be expanded to cover the entire head.

Described from many larvae collected in Washington in May, June, July, August, and October. Moths emerged in April, June, July, August, September, and November, and were determined at various times by Heinrich. Larvae which hatched April 18, 1941, were mature May 23, 1941.

*Distribution.*—California, Arizona, New Mexico, Nevada, Utah, Colorado, Kansas, Nebraska, Wyoming, Idaho, Montana, Oregon, and Washington. Canada: British Columbia and Alberta.

*Food plants.*—An omnivorous feeder on herbs, except grasses, both in the field and in the greenhouse.

### GENUS No. 11

Venter bearing minute, very slender pale spinules arising from small pale granules. Setigerous tubercle I near center of the corresponding half of the geminate middorsal white stripe..... "*Syngrapha*" *rectangula*  
 Venter bearing minute, stubby, black spinules forming a conical figure with the black basal granule, interspersed among smaller, rounded, black granules. Setigerous tubercle I in ventral margin of the corresponding half of the geminate middorsal white stripe..... "*Syngrapha*" *celsa*

#### "SYNGRAPHA" RECTANGULA (Kirby)

Head 2 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering slightly posteriorly; skin bearing minute spinules; general color green with strong, sharply defined, white stripes.

A broad, geminate, middorsal, white stripe with setigerous tubercle I near the center. A narrow white stripe including II and a white stripe including the spiracles except on 8. A dusky area composed of black granules including III. Venter green. Setigerous tubercles small, very slightly elevated even on 8; III dark, other tubercles pale. Head green, unmarked.

Described from three larvae: One collected at Puyallup, Wash., May 2, 1932, when quite immature by W. W. Baker; another collected at Devils Hole, between Lafall and Bangor, on the Olympic Peninsula of Washington, May 22, 1938, by W. W. Baker; and a third collected on the eastern slope of the Cascade Mountains, at Indian Flat Forest Camp on Highway 410 in Washington, May 26, 1939. From the larva collected May 22, a moth emerged June 21, 1938, which was determined by Clarke.

*Distribution.*—United States: Washington, Montana, Pennsylvania, New York, New Hampshire, and Maine. Canada: Nova Scotia, Quebec, and British Columbia.

*Food plant.*—Douglas-fir (*Pseudotsuga taxifolia*).

#### "SYNGRAPHA" CELSA (Hy. Edw.)

Head 2 mm. broad. Body about 25 mm. long and 4 mm. broad at middle, tapering very slightly posteriorly; skin bearing minute spinules; general color dusky green with prominent white stripes.

A broad, geminate, white, middorsal stripe with setigerous tubercle I in lateral margin. A narrow white stripe just ventrad of II and a white stripe including the spiracles except on 8. A broad stripe composed of dark spinules

including III. Setigerous tubercles rather small, not prominent even on abdominal segment 8; the ventral tubercles without any special margin of dark spinules or granules. Head green, unmarked.

Described from many larvae, only a few of which were reared to maturity, collected near Cloud Cap Inn, Mount Hood, in Oregon, July 17, 1933, and June 20, 1935, by Joseph Wilcox and the writer. A larvae collected June 20 pupated June 25 and a moth emerged July 11, 1935, which was determined by Heinrich.

*Distribution*.—United States: Montana, Oregon, and California. Canada: British Columbia.

*Food plants*.—Alpine fir (*Abies lasiocarpa*) and grand fir (*Abies grandis*).

### CHRYSASPIDIA Hbn.

#### CHRYSASPIDIA PUTNAMII (Grt.)

Head 2.8 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly; skin bearing minute, dark spinules; general color green.

A narrow, geminate, white middorsal line, a very faint white line between setigerous tubercles I and II and a distinct but slender white line ventrad of II. A strong yellowish white stripe including white line ventrad of II. A strong yellowish white stripe including the spiracles, sharply defined on both margins. Spiracles white with pale rim. Venter green. Setigerous tubercles small, flat throughout, green with black setal insertions, the ventral tubercles not outlined by dark spinules or granules. Head pale green, freckled with dilute black, all setal insertions dark, no black line at the ocelli.

Described from 10 larvae collected in western Washington by W. W. Baker and the writer in April and May. Moths emerged in May and June and were determined by Heinrich.

*Distribution*.—United States: Oregon, Washington, Montana, Minnesota, Pennsylvania, New York, Massachusetts, and Maine. Canada: Nova Scotia, New Brunswick, Manitoba, and Alberta.

*Food plants*.—Grasses.

### CALOPLUSIA Sm.

#### CALOPLUSIA HOCHENWARTHI (Hoehenw.)

The following description of *hochenwarthi* is included in the belief that our *ignea* Grt. will be found to be very similar.

Head 2 mm. broad. Body about 22 mm. long and 4 mm. broad at middle, tapering posteriorly; skin bearing long, black spinules interspersed among small dark granules; general dorsal color blackish.

A single strong, white, middorsal line, a narrower white line ventrad of setigerous tubercle I, faint traces of a pale line ventrad of II and a strong white line dorsad of and partially including the spiracles. Spiracles pale with black rim. Venter paler than dorsum, probably dusky greenish and apparently tinged with purple. Setigerous tubercles of moderate size, apparently not black but brownish, the ventral tubercles not outlined by a belt of dark spinules or granules. Head closely freckled with black on posterior half except in an area including setigerous tubercles P<sup>1</sup> and P<sup>2</sup>.

Described from two inflated larvae from Zermatt in the Swiss Alps.

*Distribution of ignea Grt.*—United States: Colorado, Utah, California, Wyoming, Montana, Washington, and Alaska. Canada: British Columbia, Alberta, and Labrador.

*Food plant of ignea Grt.*—Unknown.

## SYNGRAPHIA Hbn.

## ANAGRAPHIA McD.

1. Without dorsal white or yellow lines or these appearing faintly on abdominal segment 8 only. The minute annulus surrounding base of setae on head black..... 2  
With two or more continuous white or yellow dorsal lines..... 3
2. Head with black freckles. Ventral setigerous tubercles outlined by a belt of dark spinules or granules..... *Syngrapha orophila*  
Head unmarked. Ventral setigerous tubercles not outlined by a belt of dark spinules or granules..... Sp. No. 28
3. With but two white or yellowish dorsal lines; A broad geminate middorsal line including setigerous tubercle I or with I at lateral margin and a more slender line ventrad of setigerous tubercle II..... 4  
With three white dorsal lines: A geminate middorsal line, a line including setigerous tubercle I or between I and II, and a line ventrad of II..... 5
4. Skin bearing minute rounded granules. The minute annulus surrounding base of setae on head black. Ventral setigerous tubercles outlined by a belt of dark spinules or granules. Geminate middorsal white line including setigerous tubercle I. A sharply defined white stripe dorsad of the spiracles..... "*Autographa*" *mappa*  
Skin bearing minute spinules. Geminate middorsal white line with I at lateral margin. The minute annulus surrounding base of setae on head green. Ventral setigerous tubercles not outlined by a belt of dark spinules or granules. A yellowish stripe or line dorsad of the spiracles.  
"*Autographa*" *ampla*
5. Ventral setigerous tubercles outlined by a belt of dark spinules. Setigerous tubercle III included in a band of dark spinules. A white line between setigerous tubercles I and II. A white stripe dorsad of the spiracles.  
*Anagrapha fulcifera*  
Ventral setigerous tubercles not outlined by a belt of dark spinules or granules. Setigerous tubercle III not included in a band of dark spinules. A sinuous white line including setigerous tubercle I. A slender yellow line dorsad of the spiracles..... "*Autographa*" *corusca*

## SYNGRAPHIA OROPHILA (Hamp.)

Head 2 mm. broad. Body about 30 mm. long and 5 mm. broad at middle; skin bearing slender, upright, minute, black spinules almost in the form of pubescence; general color dark green.

No dorsal pale or white lines. A pale stripe dorsad of the spiracles; spiracles white with blackish rims. Setigerous tubercles small even dorsally on 7 and 8, green with pale apices, the setal insertions dark, ventral tubercles surrounded by a belt of dark granules. Head green, closely freckled with black.

Described from one larva collected at Paradise, Mount Rainier, in Washington, August 18, 1932, by W. W. Baker. The moth emerged September 3, 1932, and was determined by Benjamin.

*Distribution*.—United States: Washington, Montana, and Wyoming. Canada: Alberta and British Columbia.

*Food plant*.—Low huckleberry (*Vaccinium*).

## SYNGRAPHIA No. 28.

Head 2 mm. broad. Body about 27 mm. long and 5 mm. broad at middle, broadening posteriorly to but not including 8; skin bearing short spinules which are dark in the region of III and ventrally; general color olivaceous green dorsally, dark green ventrally.

Entirely without the usual white lines except the geminate middorsal line is faintly indicated on abdominal segment 8. A yellow line above the spiracles, the ventral margin obscure. Spiracles white with brown rim. Setigerous tubercles very small, little more than mere setal insertions even on 8, ventral tubercles not margined by a belt of dark granules or spinules. Head pale brownish green, unmarked.

Described from one larva collected well up on Cloud Cap Road, Mount Hood, in Oregon, June 22, 1935. The larva was parasitized.

*Distribution*.—Oregon.

*Food plant*.—Huckleberry (*Vaccinium*).

#### "AUTOGRAPHIA" MAPPA (G. & R.)

Head 2.2 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, broadening posteriorly to abdominal segment 8; skin bearing minute, rounded granules; general color dark green.

A white stripe including setigerous tubercle I, a white line ventrad of II and a sharply defined white stripe dorsad of the spiracles. Spiracles white. Venter deep green, flecked with white. Setigerous tubercles rather large, subconical, green with white setal insertions, margined by a darkened area. Head dark green, setal insertions and setae dark, no black line or stripe at the ocelli.

Described from four larvae collected at Snoqualmie Falls, Wash., April 20, 1930, by C. W. Getzendaner and the writer. A moth emerged May 12, 1930, and was determined by Heinrich.

*Distribution*.—United States: Washington, New York, New Hampshire, and Maine. Canada: Ontario, Alberta, and British Columbia.

*Food plant*.—Stinging nettle (*Urtica lyalli*).

#### "AUTOGRAPHIA" AMPLA (Wik.)

Head 2.1 to 2.3 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly; skin set closely with very minute spinules; general color green.

Geminate middorsal white line strong, straight with I in lateral margin, twice as broad as the pale line ventrad of setigerous tubercle II which may be either yellow or white. A yellowish line or stripe dorsad of the spiracles, the ventral margin indefinite. Spiracles white. Venter green. Setigerous tubercle quite small, green, the ventral tubercles not margined by dark granules. Head green, unmarked.

Described from 10 mature larvae collected in western Washington in April and early May by W. W. Baker and the writer. Moths emerged from April 12 to June 7, and were determined by Benjamin. Small larvae taken cutting holes in alder leaves in September, hibernated early in October, renewed feeding in March, and produced a moth April 16, 1946.

*Distribution*.—United States: Arizona, Utah, Colorado, Oregon, Washington, Montana, Pennsylvania, New York, New Hampshire, and Maine. Canada: Nova Scotia, Quebec, Ontario, Manitoba, Alberta, and British Columbia.

*Food plants*.—Alder, wild cherry, willow, and Indian-plum (*Osmaronia cerasiformis*).

#### ANAGRAPHIA FALCIFERA (Kirby)

Head 2 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, broadening to abdominal segment 8; skin bearing small spinules; general color green.

A geminate, white, middorsal line and white lines both dorsad and ventrad of setigerous tubercle II, the line dorsad of the tubercle broader. A longitudinal dark area including III, composed of dark spinules and margined ventrally by a white stripe dorsad of the spiracles. Spiracles white. Venter green. Setigerous tubercles rather large and prominent, white or green, the ventral tubercles margined by dark spinules. Head green, setal insertions not dark, no dark line or stripe at the ocelli.

Described from 8 alcoholic larvae reared to maturity at Chicago, Ill., August 10, 1939, by A. K. Wyatt, and 3 alcoholic larvae from Kansas in the U. S. National Museum.

*Distribution*.—United States: Oregon, Montana, Utah, Colorado, Texas, Oklahoma, Kansas, Nebraska, South Dakota, Minnesota, Illinois, Georgia, North Carolina, Virginia, Maryland, Pennsylvania, New York, Massachusetts, and Maine. Canada: Nova Scotia, Quebec, Manitoba, Alberta, and British Columbia.

*Food plants*.—Most common on celery and also recorded as feeding on cabbage, lettuce, corn, and sugar beet.

#### "AUTOCRAPHIA" CORUSCA (Stkr.)

Head width not recorded. Body about 30 mm. long and 4 mm. broad at middle, abdominal segments of about equal width to 8, with a slight dorsal hump on 8; skin bearing minute spinules; general color green.

A geminate, white, middorsal line. A broken, rather sinuous white line including setigerous tubercle I and a slender, yellow, line midway between III and the spiracles. Spiracles white. Venter green, Head green, unmarked.

Described from one larva collected at Seaside, Oreg., May 30, 1933, by W. W. Baker. This larva pupated June 3, 1933, and a moth emerged June 18, 1933, which was determined by Benjamin.

*Distribution*.—United States: Alaska, Washington, Oregon, California, and Colorado. Canada: British Columbia.

*Food plant*.—Alder.

#### AUTOCRAPHIA METALLICA (Grt.)

It has not been possible to include this species in the keys since data on some of the essential structural details are lacking in our notes.

Head 2.6 mm. broad. Body about 30 mm. long and 6 mm. broad at middle, very stout-bodied, broadening gradually posteriorly to and including abdominal segment 8; skin bearing minute spinules; general color green.

A geminate middorsal white line. A broader white line encircling setigerous tubercle I, a slender white line ventrad of II and a strong white line somewhat nearer to III than to the spiracles. Spiracles white with dark rim. Setigerous tubercles moderately large, green with white setal insertions, the ventral tubercles margined by a belt of dark spinules. Head whitish with faint green reticulation, the setal insertions concolorous with head.

Described from one larva collected in the laboratory yard at night in Puyallup, Wash., May 18, 1931, by W. W. Baker. The moth emerged June 3, 1931, and was determined by Benjamin.

*Distribution*.—United States: Washington and Montana. Canada: British Columbia.

*Food plant*.—Unknown.

### Subfamily LITHACODIINAE

1. Setigerous tubercle VII<sup>c</sup> present on abdominal segment 1 (pl. 4, G). Crochets on prolegs uniordinal. Ocellus II not more than its width from ocellus I. Prolegs absent on at least abdominal segment 3 ----- 2  
Setigerous tubercle VII<sup>c</sup> absent on abdominal segment 1 (pl. 4, H) ----- 3
2. Prolegs absent on abdominal segments 3 and 4. Some dorsal setae at least nearly as long as an abdominal segment. Small larvae broadest through median abdominal segments. Venter of abdominal segment 7 longer than that of 8 (30:30). Callus absent between tibial setae ----- *Eublemma*

- Prolegs absent on abdominal segment 3 but present, although much reduced, on 4. Dorsal setae short, approximately one-tenth as long as an abdominal segment. Abdominal segments of about equal width throughout. Venter of abdominal segment 7 shorter than that of 8 (37:50). Callus present between tibial setae..... *Lithacodia*
3. Prolegs absent on abdominal segments 3 and 4. Crochets biordinal, at least medially in the series. Ocellus II nearly twice its width removed from ocellus I (9:5). Callus absent between tibial setae..... 5
- Prolegs present on abdominal segments 3 and 4. Crochets uniordinal. Ocellus II its width or less removed from ocellus I. Callus present between tibial setae..... 4
4. Mandible without a basal tooth or process on oral face. Length of spinneret equal to six times the median width (33:5). Height of spiracle on abdominal segment 1 almost equal to that of the prothoracic spiracle (38:39). Dorsal setae short, length equal to about one-tenth that of an abdominal segment. Setigerous tubercles minute..... *Neocrastria*
- Oral face of mandible with a basal process bearing an apical molar area. Length of spinneret equal to approximately twice the median width (13:7). Height of spiracle on abdominal segment 1 much less than that of the prothoracic spiracle (15:22). Some dorsal setae nearly as long as an abdominal segment. Setigerous tubercles large, circular in outline..... *Chamyris*
5. Setigerous tubercle IV on abdominal segments 1 to 4 at the apex of a subconical fleshy projection approximately twice as high as the basal width. Postero-medial setae on anal shield and the subanal setae modified as an anal fork. Height of prothoracic spiracle equal to that of spiracle on abdominal segment 8. Length of spinneret equal to seven times the median width (30:4). Tarsal setae but slightly modified. Setigerous tubercle VII\* well anterior to VII<sup>b</sup> on abdominal segment 1..... *Eayra*
- Setigerous tubercle IV not on a projection. Postero-medial setae on anal shield and subanal setae not modified as an anal fork. Height of prothoracic spiracle much less than that of spiracle on abdominal segment 8 (15:28). Length of spinneret equal to about three times the median width (16:5). Some tarsal setae broadly lanceolate (pl. 9, *F*). Setigerous tubercle VII\* directly laterad of VII<sup>b</sup> on abdominal segment 1..... *Ozarba*

## EUBLEMMA Hbn.

General color brown. Feeds on *Gnaphalium*..... *minima*  
 General color red. Feeds on *Ipomoea*..... *obliquialis*

## EUBLEMMA MINIMA Gn.

Head 1.3 mm. broad. Body about 12 mm. long and 3.7 mm. broad through median abdominal segments and tapering both anteriorly and posteriorly from these; skin bearing coarse, somewhat elevated granules; general color brown.

Body brown, apparently without markings. Spiracles small, pale with brown rim. Setigerous tubercles small, somewhat elevated, VII<sup>c</sup> directly ventrad of VII<sup>b</sup> on abdominal segment 1, IV<sup>b</sup> displaced ventrad on 8 as on 7; setae pale, the dorsal as long as a body segment. Head brown, strongly roughened, apparently without markings.

Described from 4 alcoholic larvae in U. S. National Museum labeled "On *Gnaphalium*, J. H. Mellichamp, Bluffton, S. C., 4554" and 5 alcoholic larvae reared from *Gnaphalium* by H. K. Townes, Jr., at Greenville, S. C., IX.6.1930, and received through the kindness of Dr. A. Glenn Richards, Jr.

*Distribution.*—North Carolina, South Carolina, Georgia, Florida, Texas, Arizona, and southward.

*Food plant.*—Life everlasting (*Gnaphalium*), feeding concealed in the flower heads.

## EUBLEMMA OBLIQUALIS (F.)

Head 1.3 mm. broad. Body about 11 mm. long and 3 mm. broad through median abdominal segments and tapering both anteriorly and posteriorly; skin bearing minute, slightly isolated granules; general color largely red.

First four abdominal segments mostly bright red both dorsally and ventrally, the red coloration decreasing gradually on segments posterior to these and appearing somewhat on the thorax. A broad, white middorsal stripe on abdomen occupying the space between setigerous tubercles I and largely obliterated on first four abdominal segments. Spiracles apparently pale brown with brown rim. Setigerous tubercles moderately large, brown, elevated; some of the dorsal setae more than twice as long as an abdominal segment (120:50); III<sup>a</sup> bearing a short, stout, clavate seta; tubercles I and II close together; IV displaced ventrally on 8, in the same position as on 7; VII<sup>a</sup> directly ventrad of VII<sup>b</sup> on 1. Cervical shield pale brown or yellow. Head pale brown or yellow, unmarked.

Described from two alcoholic larvae in U. S. National Museum labeled "Ex morning glory (seeds), Richmond Hill, Ga., Sept. 15, 1944, Lot 44-24371, SS No. 20052."

*Distribution*.—Florida, Georgia, Alabama, Texas, Colorado, California, and southward.

*Food plant*.—Seeds of morning glory (*Ipomoea*).

## LITHACODIA Hbn.

(ERASTRIA Ochs.)

General color brown with reddish longitudinal lines.----- *muscosula*  
General color gray, sometimes tinged with pink, with purplish longitudinal lines. *albidula*

## LITHACODIA MUSCOSULA (Gr.)

Head 1.8 mm. broad. Body about 22 mm. long and 2 mm. broad at middle, tapering posteriorly; skin smooth; general color brown.

A dark middorsal stripe broadest on median segments and margined with reddish. Dorsal area yellow, including a pair of reddish lines on each side and margined by a reddish line. A reddish line ventrad of setigerous tubercle III and another ventrad of spiracles. Spiracles pale. Setigerous tubercles small, dark, III much the largest. A dark stripe on outer face of anal prolegs. Head pale grayish with four straight longitudinal lines and lateral reticulation black.

Described from 11 larvae collected in a swamp near Clarksville, Tenn., September 22, 1920, and others collected September 18, 1923. A moth emerged April 26, 1924, probably indoors, and was determined by Benjamin.

*Distribution*.—Maine, Massachusetts, Connecticut, New York, Pennsylvania, New Jersey, Maryland, Wisconsin, Illinois, Missouri, Tennessee, North Carolina, and Mississippi.

*Food plants*.—Grasses in a swamp, particularly "saw grass."

## LITHACODIA ALBIDULA (Gr.)

Head 1.8 mm. broad. Body about 23 mm. long and 2.5 mm. broad at middle, tapering posteriorly; skin smooth; soft gray sometimes tinged with pink.

A dusky middorsal stripe. A pale yellowish stripe to well ventrad of II margined by purplish lines and including a purplish line through I and another ventrad of II. Supraspiracular area somewhat more dusky than the dorsal area, including a white line through III. Spiracles minute, pale. A narrow, pale subventral stripe including IV and bordered dorsally and ventrally by purplish lines. Venter sordid tinged with purplish. Setigerous tubercles rather large, flat, black. Prolegs absent on abdominal segment 3 and nonfunctional on 4. Head dull white, smooth, four straight longitudinal lines and lateral reticulation black.

Described from numerous larvae collected on grasses in damp situations about Puyallup, Wash., in September. Two moths emerged April 23, 1938, and were determined by Clarke.

*Distribution.*—United States: Maine, New Hampshire, Massachusetts, New York, Pennsylvania, Illinois, Wisconsin, Texas, Oregon, and Washington. Canada: British Columbia, Alberta, and Ontario.

*Food plants.*—Grasses in moist situations.

### NEOERASTRIA McD.

#### NEOERASTRIA CADUCA (Grt.)

Head 2.1 mm. broad. Body about 30 mm. long and 4 mm. broad, abdominal segments of about equal width throughout; skin smooth; general color green. Slender white lines middorsally and well ventrad of setigerous tubercle II. A small bright red spot at posterior margin of each segment, except prothorax, ventrad of the white subdorsal line. Spiracles white partially margined with red. No subventral stripe visible in the one specimen seen. Cervical shield and anal shield apparently concolorous with adjacent parts. Setigerous tubercles minute. Head yellow freckled with black.

Described from one inflated larva in the U. S. National Museum labeled "B1389, Hyattsville, Md. Collection H. G. Dyar."

*Distribution.*—Illinois, Pennsylvania, Maryland, New Jersey, and New York.

*Food plant.*—Fruit and leaves of yellow pond lily (*Nymphaea adenata*).

### CHAMYRIS Gn.

#### CHAMYRIS CERINTHA (Treit.)

Head 2.3 mm. broad. Body about 30 mm. long and 4 mm. broad, abdominal segments of approximately equal width throughout; skin set closely with small isolated granules; general color red dorsally.

Dorsum to ventrad of setigerous tubercle II bright red bordered ventrally by a white (or yellow) stripe. Red lines appearing at V and VI, the two fused and continuous on abdominal segments 8 and 9. Remainder of body pale or green. Setigerous tubercles large, round, gently uniformly elevated except I and II strongly conical on 8 and 9, partaking of the color of adjacent parts; setae very heavy and long, that from II as long as an abdominal segment. Head color indeterminable, a slender, straight, reddish brown line originating at posterior margin of head, including P<sup>2</sup> and a similar line along margin of head posterior to the ocelli.

Described from 3 larvae in the U. S. National Museum, including 2 inflated larvae labeled "3131" and 1 alcoholic specimen collected at Baldwin, Long Island, N. Y., VII.18.1933, by Oscar Sutton, on peach.

*Distribution.*—United States: Nebraska, Kansas, Texas, Illinois, Arkansas, Mississippi, Florida, Georgia, North Carolina, West Virginia, Maryland, Pennsylvania, New York, and Massachusetts. Canada: Quebec.

*Food plants.*—Apple, plum, peach, and wild cherry (*Prunus serotina*).

### EXYRA Grt.

The writer has not been able to distinguish *Exyra semicrocea* from *E. vidingsi*. In *vidingsi* the body has a purplish transverse stripe on each segment which is not apparent in the one alcoholic specimen of

*semicrocea*, but in this case the stripes may have been removed by the preservative. The general structure and peculiar head markings are the same in both species.

#### EXYRA RIDINGSI (Riley)

Head 1.8 mm. broad. Body about 22 mm. long and 3.4 mm. broad at middle, tapering strongly posteriorly; skin bearing short, slender, brown or black hairs; general color white with a purplish transverse stripe on each segment.

The transverse purple segmental stripe may cover the segment except near the incisures or the body may be mostly white. First four abdominal segments with a transverse middorsal black spot bearing intensely black hairs. Setigerous tubercle IV borne apically on a subconical fleshy projection approximately twice as long as the basal width and set closely with hairs becoming black toward the apex. Spiracles brown with dark brown rim. Cervical shield purplish. Dorsal tubercles strongly conical except on prothorax. Head white, smooth, a black line with  $P^2$  in anterior end, a transverse black line traversing the head including  $P^1$  and  $L^1$ , a transverse black line including  $A^2$  and  $A^3$ , and a transverse black line traversing the head at base of front.

Described from 2 inflated larvae in the U. S. National Museum, 1 collected in Henderson County, N. C., July 17, 1932, in *Sarracenia*, the other at Florala, Ala., July 9, 1932, in *Sarracenia drummondii*, both by J. E. Benedict, and 4 alcoholic larvae collected in Screven County, Ga., July 1, 1946, by A. K. Wyatt on *Sarracenia flava*.

*Distribution*.—Florida, Alabama, Georgia, South Carolina, and North Carolina.

*Food plants*.—Pitcherplant and trumpet leaf (*Sarracenia*).

#### EXYRA SEMICROCEA (Gn.)

Head 1.9 mm. broad. Body about 20 mm. long and 3.4 mm. broad at middle, tapering somewhat posteriorly; skin granules bearing short, slender black hairs; general color indeterminate.

A transverse black middorsal spot on abdominal segments 1 to 4 including setigerous tubercles I and II and bearing intensely black hairs. Spiracles dusky with dark brown rim. Setigerous tubercle IV located apically on a subcylindrical fleshy projection about twice as high as wide and bearing intensely black hairs. Setigerous tubercles large, black or brown, somewhat elevated. Head apparently pale, a black line with  $P^2$  in anterior end, a transverse black line across apex of front including  $P^1$  and  $L^1$ , a transverse black mark including  $A^2$  and  $A^3$  and a transverse black line across base of front.

Described from one alcoholic larva in U. S. National Museum collected near Minot, Montgomery County, Ga., VII.4.1932, by J. E. Benedict in *Sarracenia*.

*Distribution*.—District of Columbia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, and Texas.

*Food plant*.—Pitcherplant (*Sarracenia*).

#### OZARBA Wlk.

##### OZARBA AERIA (Grl.)

Head 1.5 mm. broad. Body about 20 mm. long and 2.8 mm. broad, abdominal segments of about equal width throughout; skin smooth; general color indeterminate.

All markings erased by the preservative. Setigerous tubercles on head and thorax in small black spots. Spiracles pale brown with brown rim. Frontal setae very close to lateral margin of front, six times as near to margin as to each other (4:24) and five times as near to base as to apex of front (7:35). Ocelli I and II nearly twice the width of II apart (9:5). Setigerous tubercle VII<sup>a</sup> directly dorsad of VII<sup>b</sup> on abdominal segment 1.

Described from six alcoholic larvae from the U. S. National Museum labeled "Ex *Cuphea micropetala*, Brownsville, Tex., Oct. 1944. Lot 44-27488. Det. C. H."

*Distribution*.—Texas, Alabama, North Carolina, New Jersey, Pennsylvania, and Wisconsin.

*Food plant*.—*Cuphea micropetala*.

### Subfamily SARROTHRIPINAE<sup>23</sup>

Tarsal setae not modified. Frontal setae at lateral margin of front... *Characoma*  
Some of the tarsal setae strongly spatulate. Frontal setae well removed from lateral margin of front..... *Sarrothripus*\*

#### SARROTHRIPUS Curtis

Oral face of mandible with a tooth arising from second ventral rib... *frigidana*  
Oral face of mandible without a tooth..... *cinereana* (?)

#### SARROTHRIPUS FRIGIDANA (Wlk.)

Head 2 mm. broad. Body about 22 mm. long and 2.5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color green.

Green throughout without markings. Setae pale, slender, the dorsal twice as long as an abdominal segment or more. Spiracles pale with pale brown rim. Setigerous tubercles minute. Head green, without markings.

Described from six larvae collected at Indian Flat on Highway 410 in eastern Washington, June 28, 1939, on willow. A moth emerged July 24, 1939, and was determined by Clarke as *Sarrothripus revayana* var. *lintnerana*, Speyer which McDunnough considers to be a synonym of *frigidana* Walk.

*Distribution*.—United States: New York, Pennsylvania, Tennessee, and Washington. Canada: British Columbia, Alberta, Manitoba, Quebec, and Nova Scotia.

*Food plant*.—Willow.

#### SARROTHRIPUS CINEREANA (Neum. & Dyar) (?)

Head 2 mm. broad. Body about 19 mm. long and 2.5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color green.

Rather dark olivaceous green throughout, entirely without markings. Setae pale, slender, exceedingly long. Spiracles pale. Setigerous tubercles minute. Head smooth, pale brownish green without markings.

Described from several larvae beaten from cottonwood trees about 10 miles east of Currant Flat Ranger Station on Highway 410 in eastern Washington, July 7, 1935. No moths were reared since, at this time, but one species was recognized in the genus whereas it has now been shown by McDunnough (32) that we have three species. Apparently this could be either *columbiana* Hy. Edw. or *cinereana* N. & D., with the probability in favor of *cinereana* since *columbiana* is known from Vancouver Island, only.

*Distribution*.—United States: California, Nevada, Colorado, Montana, and Washington. Canada: British Columbia, Manitoba, and Quebec.

*Food plant*.—Cottonwood (*Populus*).

<sup>23</sup> McDunnough (32) uses *Nycteolinae* and *Nycteola* for these concepts.

## CHARACOMA Wlk.

## CHARACOMA NILOTICA (Rogenh.)

Head 1.25 mm. broad. Body about 9 mm. long and 1.5 mm. broad, abdominal segments of about equal width to 8; skin smooth; general color pale greenish.

No visible markings on body except that the cervical shield has the middorsal line broadly margined with black and bears a more intensely black transverse area on posterior margin. Spiracles pale brown with brown rim. Setigerous tubercles small but not mere setal insertions, some of the dorsal setae as long as an abdominal segment. Head pavement-granulose, either covered by smoky infuscation with black freckles showing through or paler with the freckles more or less indistinct.

Described from eight alcoholic larvae in U. S. National Museum labeled "Ex almond, Key West, Fla., March 30, 1935, Lot 45-8795, S. S. No. 48876."

*Distribution*.—Maine, New Hampshire, New York, Pennsylvania, Tennessee, Mississippi, Florida, Missouri, Iowa, Illinois, Texas, Colorado, and Arizona.

*Food plants*.—Black almond, willow, and, in the Old World, tamarisk.

## Subfamily CATOCALINAE

## A Grouping of Genera in the CATOCALINAE

1. Labial palpus not more than half as long as the spinneret. Ocelli IV and VI not more than the width of IV apart. Setigerous tubercle VIII on abdominal segments 1 and 2 modified, like a small, usually round, spiracle and without a seta (pl. 7, F). Arrangement of the setigerous tubercles of the VII group nearly or quite the same on 2 as on 1, with VII<sup>a</sup> far anterior to the transverse line of VII<sup>c</sup> on both segments.

Group 1, p. 270; *Uloagnada*, *Phoberia*, *Lilocola*, *Melipotia*, *Bulia*, *Drasleria*, and *Synedoida*

Labial palpus nearly or quite as long as the spinneret. Ocelli IV and VI usually distinctly more than the width of IV apart..... 2

2. Without an extra setigerous tubercle on abdominal segments between II and IV (pl. 6, B)..... 3

With an extra setigerous tubercle on abdominal segments, much reduced or absent on 7 and 8, in a line with IV and II, as large as these tubercles on anterior abdominal segments, and equidistant between them or somewhat nearer to II (pl. 6, A)

3. Setigerous tubercles of the VII group on abdominal segment 1 with line VII<sup>b</sup>-VII<sup>a</sup> at least nearly twice as long as VII<sup>b</sup>-VII<sup>c</sup> (26:14), (pl. 4, K).... 4

Setigerous tubercles of the VII group on abdominal segment 1 with line VII<sup>b</sup>-VII<sup>a</sup> at most but slightly longer than VII<sup>b</sup>-VII<sup>c</sup> (14:11), (pl. 4, J). Arrangement of the tubercles of the VII group nearly or quite the same on abdominal segments 1 and 2, with VII<sup>a</sup> usually but slightly, if at all, anterior to the transverse line of VII<sup>c</sup>

Group 5, p. 319; *Hypporophia*, *Calpe*, *Anticarsia*, *Gonodonta* and *Plusiodonta*

4. Prolegs absent on abdominal segment 3 and sometimes on 4. Setigerous tubercle VIII on abdominal segments 1, 2, and 7 with a seta but this very short and stout, almost conical, in some genera. Feed on herbs. (*Celiptera* may be an exception)

Group 2, p. 276, Genus No. 14; *Tathorhynchus*, *Celiptera*, *Euclidina*, *Caenurgina*, *Caenurgina*, *Ptichodis*, and *Mocis*

Prolegs present on abdominal segments 3 and 4 although reduced in size. Feed on woody plants..... 5

5. Setigerous tubercle VIII on abdominal segments 1 and 2, and often on 7, without a seta<sup>11</sup> (pl. 7, R)  
 Group 3, p. 281; *Allotria*, *Zalcops*, *Yrias*, *Heteranassa*, *Panopoda*,  
*Safia*, *Otosema*, and *Strenoloma*
- Setigerous tubercle VIII on abdominal segments 1, 2, and 7 with a seta  
 Group 4, p. 287; *Euparthenos*, *Paralleliu*, *Zalc*, *Tosocampa*, and  
*Catoccia*

## CATOCALINAE, Group 1

All of the known structural differentiating characters which are stable are employed in the following key, but these do not provide a sufficient basis for the characterization of genera.

1. Third segment of labial palpus scarcely longer than the second segment and not more than one-fourth as long as the basal segment (2:8) (pl. 10, B).  
 Postero-median setae on anal shield approximately twice, or more, as far from each other as from the postero-lateral setae.----- 2
- Third segment of labial palpus twice as long as the second segment and at least nearly half as long as the basal segment (4:9). Postero-median setae on anal shield often approximately equidistant from each other and the postero-lateral setae.----- 7
2. Mandibular setae on a large umbo. (pl. 11, O). Head with longitudinal stripes which may not be very sharply defined.----- 3
- Mandibular setae on a broad, slightly convex area (pl. 11, N). Hind coxae approximately one-third the femur width apart (15:42). Prolegs bearing crochets on abdominal segment 3.----- 6
3. Hind coxae approximately one-half the femur width apart (23:38). Head strongly depressed. Hypopharynx very peculiar (pl. 11, L). Prolegs bearing crochets on abdominal segment 3.----- *Synedoida divergens*
- Hind coxae nearly or quite touching. Head strongly arched on the occiput. Hypopharynx of a type usual in the group (pl. 11, M)----- 4
4. Prolegs non-functional knobs on abdominal segment 3.----- 5
- Prolegs reduced but bearing crochets on abdominal segment 3. Molar area sessile on base of mandible. General color white.--- *Drasteria mirifica* (?)
5. Setigerous tubercle II on abdominal segment 8 moderately large and somewhat elevated. General color light gray.----- *Synedoida howlandi*
- Setigerous tubercle II on 8 small, flat. General color brown.----- *Drasteria occulta*
6. Skin pavement-granulose. Head not striped. Molar area on mandible sessile on the base and surrounded by a slightly elevated rim.--- *Melipotis indomita*
- Skin smooth. Head with conspicuous light and dark longitudinal stripes. Basal molar area on mandible borne on a process.----- *Melipotis perpendicularis*
7. Tubercle VIII on abdominal segments 1 and 2 very small, the transverse diameter less than the diameter of VII<sup>b</sup> (2:3). Base of leg claw angulate apically. Postero-median setae on anal shield equidistant from each other and the postero-lateral setae (pl. 6, E)----- *Phoberia atomaris*
- Tubercle VIII on abdominal segments 1 and 2 larger, usually much larger, the transverse diameter equal to at least twice the diameter of VII<sup>b</sup>.----- 8
8. Base of leg claw with an acute distal tooth. Postero-median setae on anal shield approximately twice as far from each other as from the postero-lateral setae (22:12). Larger larvae, the head 3.7 mm. broad at maturity.----- 9
- Base of leg claw broadly rounded, not at all angulate. Smaller larvae, the head 3.5 mm. broad, or less, at maturity.----- 10

<sup>11</sup> Setae are present on VIII in some immature stages of *Zalcops* while in *Otosema*, *Strenoloma*, *Panopoda*, and *Allotria* a minute, fleshy, conical papilla is socketed in the modified tubercle (pl. 7, W). On abdominal segment 7, tubercle VIII sometimes bears a minute seta in *Panopoda* and this is always present on 7 in *Strenoloma*.

9. Mandible with a molar area borne on a slight basal process. Adfrontal areas pale.----- *Utosyneda vicius*  
Mandible without a basal molar area or process. Adfrontal areas black.----- *Utosyneda subtermina*
10. Basal molar area on mandible borne on a large process. Postero-medial setae on anal shield much farther from each other than from the postero-lateral setae (20:12). Hypopharynx peculiar (pl. 11, K)----- *Bulia deducta*  
Molar area of mandible sessile on the base and surrounded by a slightly elevated rim. Postero-medial setae on the anal shield approximately equidistant between each other and the postero-lateral setae. Hypopharynx not as above----- 11
11. Anal shield, at most, but slightly rugose with the setigerous tubercles large and convex. Head without a definite dark stripe including setae P<sup>1</sup> and P<sup>2</sup>----- *Lilocala sessegnata*  
Anal shield strongly rugose with the setigerous tubercles small and flat. Head with a distinct black stripe including setae P<sup>1</sup> and P<sup>2</sup>----- 12
12. Anal shield a contrasting black.----- *Melipotis novanda*  
Anal shield brownish, inconspicuous.----- *Melipotis jucunda*

## SYNEDOIDA Hy. Edw.

## SYNEDOIDA DIVERGENS (Behr.)

Head 2.9 to 3 mm. broad. Body about 35 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin smooth; general color pale grayish brown.

Markings distinct but of subdued intensity. Middorsal pale stripe, including a dark median and two broken purplish lines, slightly segmentally constricted but not conspicuously irregular. Dark stripe including setigerous tubercles I and II not at all sinuate, margined by inconspicuous dark lines. Pale stripe between II and III including a purplish line, flecked with purple and margined ventrally by a purplish stripe including III and the spiracles. Spiracles infuscated brown or black. Subventral pale stripe distinct. All but a narrow, pale, median area on venter flecked with purple; no trace of purplish spots between the prolegs. Head pale brown, a white line with setae P<sup>1</sup> and P<sup>2</sup> in dorsal margin and another with A<sup>2</sup> and L<sup>1</sup> in ventral margin, a few dark lines posterior to the ocelli, dark submedian area absent or appearing on occiput only; otherwise with very sparse dark reticulation.

Described from many larvae collected on the eastern slope of the Cascade Mountains at various forest camps on U. S. Highway 410 in Washington during August and September. Moths emerged from late May to early in July of the following year, and were determined by Richards.

*Distribution*.—Arizona, Colorado, Utah, Nevada, California, Oregon, Washington, Idaho, and Montana.

*Food plant*.—Elder (*Sambucus glauca*).

## DRASTERIA MIRIFICA (Hy. Edw.)

Head 2.2 mm. broad. Body about 30 mm. long and 3.5 mm. broad at middle, tapering strongly posteriorly; skin smooth; general color white.

The usual black stripe including setigerous tubercles I and II and that including III and the spiracles reduced to their subdued, dark marginal lines and so filled with white and pinkish as to give the general color effect of white. Spiracles brown. The pale middorsal stripe and the pale stripe between II and III indicated by the subdued marginal lines of the intervening stripes, the subventral pale stripe lost in the general white subventral and ventral coloration, a faint pinkish midventral line on anterior abdominal segments. Head white, with a stripe composed of pinkish reticulation above apex of front, a similar stripe including setae A<sup>1</sup> and A<sup>2</sup> and extending the length of the head and several pink lines posterior to the ocelli.

Described from one larva collected near Pasco, Wash., September 24, 1930, by W. W. Baker. No moth was reared. The larva agrees with

the description by Dyar (24) (as *Syneda hastingsi*), the food plant is the same, and *mirifica* occurs in Washington.

*Distribution*.—New Mexico, Arizona, California, Nevada, Utah, Colorado, Kansas, Nebraska, Oregon, and Washington.

*Food plant*.—A low, whitish species of *Eriogonum* (*Eriogonum niveum*).

#### SYNEDOIDA HOWLANDI (Grt.)

Head 2.5 mm. broad. Body about 35 mm. long and 3 mm. broad at middle, tapering posteriorly; skin smooth; general color light gray.

A pale middorsal stripe twice expanded on anterior abdominal segments. A dark, sinuous stripe including setigerous tubercles I and II and another including III and the spiracles; these stripes flecked and margined with reddish. Longitudinal area between II and III white flecked with reddish. Head pale whitish, conspicuously longitudinally striped; a white stripe extending length of head with setae P<sup>2</sup> and P<sup>3</sup> in dorsal margin, A similar stripe with A' and L' on ventral margin and a similar subocellar stripe; all these alternating with dark stripes.

Described from one inflated larva in U. S. National Museum labeled "No. 1009 Dyar and Caudell coll."

*Distribution*.—Texas, New Mexico, Arizona, Nevada, Utah, Colorado, Nebraska, Montana, Idaho, Oregon, and Washington.

*Food plant*.—*Eriogonum*.

#### DRASTERIA Hbn.

##### DRASTERIA OCCULTA (Hy. Edw.)

Head 2.9 mm. broad. Body about 26 mm. long and 3 mm. broad at middle, tapering posteriorly; skin smooth; general color brown.

Dorsum to and including setigerous tubercle II infuscated brown, the coloration composed of six narrow pale lines alternating with seven slender blackish lines. Ventrad of this a broad pale band somewhat flecked with reddish. Including setigerous tubercle III and extending to well ventrad of the spiracles, a stripe of dorsal color bordered ventrally by a pale subventral stripe flecked with reddish. Spiracles black. Venter of dilute dorsal coloration, mottled with reddish. Head obscurely roughened, the brown adfrontal areas margined by narrow white stripes as is also the median line; remainder of head with three longitudinal white stripes alternating with prominent, reticulate, infuscated brown stripes.

Described from three larvae collected in Maine in July and received through the kindness of Dr. C. R. Phipps. Moths are said to emerge in June of the following year.

*Distribution*.—Maine, New Hampshire, Massachusetts, New York, New Jersey, and Pennsylvania.

*Food plant*.—Blueberry (*Vaccinium*).

#### MELIPOTIS Hbn.

##### MELIPOTIS INDOMITA (Wlk.)

Head 3.5 mm. broad. Body about 32 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly; skin pavement granulose; general color blackish with prominent gray stripes.

A prominent gray middorsal stripe including several broken dark lines. A straight dark stripe including setigerous tubercles I and II and a strong, straight dark stripe including III and the spiracles. Area between II and III gray, including several broken dark lines. Spiracles black. Ventrad of the spiracles uniformly pale, without a definite pale subventral stripe and without dark spots anterior to the prolegs midventrally. Head a decided brown, the black submedian arcs and reticulation concealed by diffused infuscation except laterally.

Described from many live larvae collected at Uvalde, Tex., in May 1924 by D. C. Parman and 7 alcoholic larvae collected at Abilene, Tex., in July 1942, by S. E. Crumb, Jr. Moths emerged in June from the Uvalde, Tex., specimens, and were determined by Schaus.

*Distribution*.—Texas, New Mexico, Arizona, Kansas, Colorado, Utah, Nevada, California, and southward.

*Food plant*.—Mesquite (*Prosopis*).

#### MELIPOTIS PERPENDICULARIS (Gn.) (?)

Head measurement not recorded. Body about 33 mm. long and 4 mm. broad at middle, tapering posteriorly; skin smooth; general color rather dark with distinct longitudinal stripes.

All markings are sharp and nearly parallel-margined.

Middorsal pale stripe prominent, including a geminate dark line. Black stripe including setigerous tubercles I and II with the margining ventral line straight and not more intensely black than the remainder. Pale stripe between II and III yellowish, closely reticulate with purple and including a narrow dark purplish stripe. Stripe including III and the spiracles black. Spiracles deep infuscated brown, appearing black. Subventral stripe yellow, closely reticulate with purple and bordered ventrally by a purplish stripe; thence to base of prolegs yellow strongly spotted with purple, including two purplish lines. Venter pale, with a purple median line somewhat broadened between the prolegs. Anal shield coarsely granulose, brownish. Head pale brownish with the adfrontal areas and median line black; nearly parallel black stripes, and sparse brownish fuscous reticulation.

Described from 1 mature and 3 immature larvae beaten from *Dodonaea viscosa* at night on the grounds of the Southwestern Arboretum near Superior, Ariz., about the middle of May 1938. A larva pupated June 11 and the moth emerged July 7, 1938. This moth (No. 526 in U. S. National Museum) was determined by Clarke as "very near *Melipotis perpendicularis* (Gn.)."

*Distribution*.—Arizona, Texas, Florida, and southward.

*Food plant*.—*Dodonaea viscosa*.

#### PHOBERIA Hbn.

##### PHOBERIA ATOMARIS Hbn.

Head 3.1 mm. broad. Body about 34 mm. long and 3.5 mm. broad at middle, tapering distinctly posteriorly; skin smooth; general color gray.

Middorsal pale stripe indefinite, once constricted on each abdominal segment, without wing-like lateral enlargements and filled with blackish reticulation. Black stripe including setigerous tubercles I and II obscure except in a more or less distinct black ventral line which forms characteristic black spots about I and II. Pale stripe between II and III including two median dark lines and marked with pinkish. Dark stripe including III and the spiracles darker than remainder of coloration. Spiracles black. A narrow obscure, pale subventral stripe marked with pinkish. Venter to base of legs and prolegs of dilute dorsal coloration but more tinged with pinkish; midventer with pinkish spots anterior to the prolegs. Head white with the irregular submedian arcs and full reticulation black.

Described from five alcoholic larvae reared from the egg to maturity at Ithaca, N. Y., in April-May 1940, by J. G. Franclemont.

*Distribution*.—Texas, Colorado, Nebraska, Kansas, Missouri, Illinois, Florida, Georgia, North Carolina, Tennessee, Maryland, Pennsylvania, New Jersey, New York, and New Hampshire.

*Food plant*.—Oak (*Quercus borealis*) (teste Franclemont).

## ULOSYNEDA Smith

## ULOSYNEDA VALENS (Hy. Edw.)

Head 3.6 to 3.8 mm. broad. Body about 40 mm. long and 6.5 mm. at middle, tapering posteriorly; skin smooth; general color gray.

Middorsal pale stripe once constricted on abdominal segments, the anterior portion largest, including a diffuse black median line and in an area reticulate with white and extending to the irregular, slender black stripe including setigerous tubercles I and II ventrad of which is a broad, distinct pale stripe flecked with brownish and fuscous and including a dark line dorsad of the centre. An irregular black stripe including III and the spiracles. Spiracles black. A narrow, pale subventral stripe. Venter pale flecked with purplish, no trace of midventral dark spots. Head pale brown with black submedian arcs and reticulation and brownish lines posterior to the ocelli.

Described from many larvae collected near Superior, Ariz., in May 1938. From material kept out of doors, moths emerged in February and March 1939, and were determined by Richards.

*Distribution.*—Texas, Arizona, Colorado, and Utah.

*Food plant.*—Oak.

## ULOSYNEDA SUBTERMINA (Sm.)

Head 3.8 to 4 mm. broad. Body about 40 mm. long and 6 mm. broad at middle, tapering decidedly posteriorly; skin smooth; general color dark gray.

The pale middorsal stripe constricted on each abdominal segment, giving off a winglike extension on some abdominal segments and including a diffuse, dark median line. A narrow, sinuous black stripe including setigerous tubercles I and II ventrad of which is a pale stripe including a dark line dorsad of the centre. Spiracles and III in a sinuous black stripe. Spiracles black. The pale subventral stripe margined ventrally by a broken infuscated purplish line. Venter pale flecked with purple, no trace of midventral dark spots. Head brown with black submedian arcs and reticulation.

Described from about 40 larvae taken under bands on oak near Tieton, Wash., in May and June 1939. From material kept out of doors, moths emerged in February and March, and were determined by Clarke.

*Distribution.*—United States: Colorado, California, and Washington. Canada: British Columbia.

*Food plant.*—Oak.

## BULIA Wlk.

## BULIA DEDUCTA (Morr.)

Head 2.6 mm. broad. Body about 24 mm. long and 4 mm. broad at middle, tapering posteriorly; skin smooth; general color gray.

Middorsal pale stripe flecked with black, margined ventrally by the sinuous black stripe including setigerous tubercles I and II in which the ventral margining line is the stronger. A pale stripe between II and III including a slender dark stripe dorsad of the middle; margined ventrally by a black stripe including III and the spiracles. Spiracles black. The pale subventral stripe margined ventrally by a dark stripe including V and VI. Venter pale with three purplish lines on anterior abdominal segments and median dark spots anterior to the prolegs. Anal shield reticulate with black, the tubercles large, pale, roundly elevated, with black setal insertions. Head pale brown, rather fully reticulate with black, the black submedian arcs broad anteriorly, represented on occiput by a black line with P<sup>2</sup> in anterior end.

Described from 12 larvae collected at Superior, Ariz., and Congress Junction, Ariz., in May. Moths emerged in June and July, and were determined by Clarke.

*Distribution*.—Arkansas, Texas, Oklahoma, Kansas, Nebraska, Colorado, Utah, New Mexico, Arizona, California, and southward.  
*Food plant*.—Mesquite (*Prosopis*).

## LITOCALA Harv.

## LITOCALA SEXSIGNATA (Harv.)

Head 2.8 to 3 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color gray with a strong, sinuate, black line ventrad of setigerous tubercle II.

Middorsal pale stripe broad but subdued, usually with a winglike extension on most abdominal segments. The dark stripe including I and II subdued blackish margined ventrally by an intensely black sinuate line. A subdued pale stripe between II and III including a narrow dark stripe and margined by a subdued dark stripe including III and the spiracles. Spiracles dark, infuscated brown. Subventral stripe white marked with purple and margined ventrally by an indefinite purplish stripe. Venter pale with purplish flecks and reticulation and with very faint dilute purplish spots between the prolegs. Head pale, without submedian arcs but with strong black reticulation, with brownish lines posterior to the ocelli, a white mark between setae  $P^1$  and  $P^2$ .

Described from about 30 larvae collected near Superior, Ariz., and about 55 miles north of Phoenix, Ariz., from late in April to the middle of May 1938. Moths emerged in February and March of the following year, and were determined by Richards.

*Distribution*.—New Mexico, Arizona, California, Nevada, Utah, and Colorado.

*Food plant*.—Oak.

## MELIPOTIS NOVANDA (Gn.)

Head 3 mm. broad. Body about 37 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin smooth; general color brownish.

Middorsal pale stripe without segmental lateral extensions on some posterior abdominal segments in these specimens, bearing a median dark line and margined by brownish lines. Black stripe including setigerous tubercles I and II with the intensified black line ventrad of II contrasting but not very conspicuous and scarcely at all sinuate. The pale stripe between II and III including a geminate infuscated brownish line and margined ventrally by a dark stripe including III and the spiracles. Spiracles clear brown. Body abruptly paler ventrad of the line of the spiracles, the markings purplish; without a distinct subventral pale stripe. Venter pale, without a trace of dark purplish median spots and with two purplish lines in the line of the legs and prolegs. Cervical shield monochorous with adjacent parts, the markings sharper than on the body. Anal shield conspicuous, contrasting black. Head brown, the black submedian arcs largely invaded by reticulation and with only a few dark, oblique lines between them dorsally; a pale line dorsad of the ocelli with a little dark reticulation above it and dark lines posterior to the ocelli.

Described from numerous larvae collected at Superior, Ariz., in May 1938. Moths emerged in June and July, and were determined by Clarke.

*Distribution*.—Arizona, Texas, and Colorado.

*Food plant*.—Catclaw (*Acacia greggi*).

## MELIPOTIS JUCUNDA Hbn.

Head 2.9 to 3 mm. broad. Body about 35 mm. long and 3.7 mm. broad, tapering decidedly posteriorly; skin smooth; general color moderately dark gray with a purplish brown tinge.

Middorsal pale line conspicuous throughout or only on some abdominal segments; often giving off an arm on some segments traversing the sinuous black

stripe including setigerous tubercles I and II. Body tending to be definitely brownish from this black stripe to base of prolegs, the subdued markings including: a pale stripe between II and III including a narrow dark stripe, a dark stripe including III and the spiracles, a pale subventral stripe and a dark stripe margining this ventrally. Spiracles dark, infuscated brown. Venter white with three purple lines on abdominal segments 1 and 2, flecked with purple and with obscure purple spots between the prolegs. Cervical shield concolorous with adjacent parts. Anal shield brownish, inconspicuous. Head pale brown with broad black submedian arcs and sparse black, reticulation, paler laterally with brownish lines, ventral surface black.

Described from many larvae collected at Superior, Ariz., and near Hillside, Ariz., the forepart of May 1938. Moths emerged in June and July, and were determined by Clarke.

*Distribution*.—Generally distributed over the United States but less common in the north; also found in British Columbia.

*Food plants*.—Willow (*Salix* spp.) and catclaw (*Acacia*).

### CATOCALINAE, GROUP 2

In the second section of this group, six generic names are included but the writer has been able to find but three divisions which are separable on characters of generic importance. In fact, in *Celiptera* and *Euclidina*, on the one hand, and *Caenurgia*, *Caenurgina* and *Ptichodis*, on the other, the larvae of the groups are barely separable as species. After examining several sets of larvae, both alive and preserved, reared from officially determined moths, the writer has found no means of distinguishing between larvae of *Caenurgina erecta* and those of *C. crassiuscula*.

1. Arrangement of setigerous tubercles of the VII group the same on abdominal segments 1 and 2, with VII<sup>a</sup> far anterior to the transverse line of VII<sup>a</sup> on both segments (pl. 4, K). Mandible with a thin, transverse, shelflike basal structure on oral face.----- 2
- Arrangement of setigerous tubercles of the VII group on 1 decidedly different from that found on 2, VII<sup>a</sup> not being anterior to the transverse line of VII<sup>a</sup> on 2 while it is far anterior on 1. Mandible unarmed basally or with two small, obscure basal teeth on oral face. Tarsal setae terete.----- 3
2. Prolegs absent on abdominal segments 3 and 4. Some of the tarsal setae broadly flattened, lanceolate.----- Genus No. 13
- Prolegs absent on abdominal segment 3 but present on 4. Tarsal setae not flattened, terete.----- *Tathorhynchus*
3. Prolegs absent on abdominal segment 3 but present on 4. Dark dorsal coloration of head not composed of lines but uniform.----- *Celiptera*, *Euclidina*
- Prolegs absent on abdominal segments 3 and 4. Dark dorsal coloration of head composed of parallel longitudinal lines.----- 4
4. Mandible with three, often obscure, teeth on ventral half of cutting margin and an obscure marginal molar area on the toothless dorsal half  
*Caenurgia*, *Caenurgina*, *Ptichodis*
- Mandible with two small teeth submedially on cutting margin, with a long, very distinct, marginal molar area both dorsal and ventrad of these teeth.----- *Mocis*

#### GENUS No. 13

#### SPECIES No. 32

These larvae probably are immature.

Head 2.3 mm. broad. Body about 16 mm. long and 2.3 mm. broad at middle, tapering slightly posteriorly; skin smooth; general color indeterminate; rather uniformly dark or brown dorsally to the spiracles.

A paler middorsal stripe is indicated as is also a dark stripe including setigerous tubercles I and II. The area from ventrad of II to the broad, white

subventral stripe, occupied by five subdued dark lines becoming somewhat darker toward the ventral margin of the area. Spiracles brown. Venter darker than the dorsum. Setigerous tubercles minute except II of moderate size and broadly elevated. Head smooth, a pale stripe margining the adfrontal areas apically and extending to posterior margin of head and including two dark lines parallel to the median line; a dark stripe including setae P<sup>1</sup> and P<sup>2</sup> and margining the adfrontal areas anteriorly; a pale stripe including setae A<sup>1</sup> and A<sup>2</sup> and extending nearly to posterior margin of head; a broad dark area laterad of this including ocelli I to IV ventrad of which is a broad white stripe including ocelli V and VI; ventral surface dark.

Described from three larvae swept from grass at Quincy, Fla., in May 1928. No moth was reared.

*Distribution*.—Florida.

*Food plant*.—Grass.

### TATHORHYNCHUS Hamp.

#### TATHORHYNCHUS ANGSTIORATA (Gr.)

Head 2.1 mm. broad. Body about 27 mm. long and 3 mm. broad at middle, tapering strongly posteriorly; skin smooth; general color whitish dorsally, darker ventrally.

Body whitish dorsally to well ventrad of the spiracles; with a slender, dark middorsal line and about seven similar lines on each side, the ventral pair including the spiracles. A white subventral stripe ventrad of the white spiracles. A dark stripe including setigerous tubercle V on most abdominal segments. Venter distinctly darker than the dorsum. Setigerous tubercles minute except I and II larger but nearly flat on abdominal segments 7, 8, and 9. Head smooth, white, with five slender, black, longitudinal lines on each side, the ventral pair with a little dark reticulation between them; a black stripe on ventral surface.

Described from six alcoholic larvae from U. S. National Museum labeled "Ysleta, Tex., Oct. 1943, on alfalfa, H. W. C."

*Distribution*.—Nebraska, Kansas, Texas, Colorado, New Mexico, Arizona, and California.

*Food plant*.—Alfalfa (teste Capps). Also reared from alfalfa in Arizona (teste L. J. Hogg).

### EUCLIDINA McD.

#### CELIPTERA Gn.

No intersegmental dark spots beside the middorsal pale stripe between abdominal segments 1 and 2. Prolegs reticulate with black. Longitudinal stripes between setigerous tubercles II and III not obscured by dark markings posteriorly on abdominal segment 1, on 2, and anteriorly on 3. . . . . *Euclidina cuspidata*  
Small dark intersegmental spots present beside the pale middorsal stripe between abdominal segments 1 and 2. Shields and outer face of prolegs usually entirely black except white spots at the setal insertions. Longitudinal stripes between setigerous tubercles II and III obliterated by dark markings posteriorly on abdominal segment 1, on 2, and anteriorly on 3

*Celiptera frustulum*

#### EUCLIDINA CUSPIDATA (Hbn.)

Head 3 mm. broad. Body about 35 mm. long and 4 mm. broad at middle, tapering posteriorly; skin smooth; general color rather pale with a strong, continuous, dark stripe above and partially including the legs and prolegs.

A subdued, pale middorsal stripe including a geminate reddish line and bordered by dark stripes, more distinct on thorax and including a pale line dorsad of setigerous tubercle I and another including II. Ventrad of these dark stripes and extending to below the spiracles the coloration is composed of a

mixture of longitudinal, white, reddish, and brownish lines. Spiracles pale brown. From well below the spiracles a dark area, including several pale, longitudinal lines, extends upon the bases of the legs and prolegs. Midventer pale with dark longitudinal lines and with purplish black spots between the prolegs. Setigerous tubercles minute throughout. Head smooth, the pale areas including the front, adfrontal areas and a narrow adjacent margin, a stripe on the median line, and a band including the ocelli, extending to the black ventral coloration and marked with reddish; dorsum otherwise mostly dusky brown or black usually with but faint traces of pale lines except posteriorly; mandible with three obscure basal teeth.

Described from three inflated larvae: Two from the U. S. National Museum labeled "No. 2823, Sept. 7, 1892," and one from the Brooklyn Museum without data, and one alcoholic specimen from the National Museum without data.

*Distribution.*—United States: Maine, New Hampshire, New York, Pennsylvania, Maryland, North Carolina, Illinois, Minnesota, Montana, and Oregon. Canada: Alberta and British Columbia.

*Food plants.*—Clover, lupine, and grasses.

#### CELIPTERA FRUSTULUM (Gn.)

Head 3 to 3.2 mm. broad. Body about 40 mm. long and 4 mm. broad at middle, tapering both anteriorly and posteriorly from median abdominal segments; skin smooth; general color varying from pale gray to infuscated brownish.

Dark markings of body composed of close, wavy, usually obscure lines on a whitish ground, all of which may be particularly obscure in brown specimens. Middorsal pale line broad, continuous, nearly parallel-margined, originating at the occipital sinus of head and sometimes crossing the anal shield. A small, dark intersegmental spot each side of the middorsal line between abdominal segments 1 and 2. A dark stripe including setigerous tubercles I and II bordered ventrally by a pale stripe; both stripes tending to be obliterated on anterior abdominal segments by diffusion of the dark coloration as are also the slender dark stripe including III and partially including the spiracles and the pale subventral stripe. Venter to base of prolegs darker than the dorsum, paler midventrally with a dark midventral line forming a spot anterior to the prolegs on abdominal segment 4. Spiracles brown. Setigerous tubercles minute. Head smooth, the pale areas including the front, adfrontal areas and a narrow adjacent margin, a stripe on the median line and a lateral band including the ocelli extending to the black ventral coloration and including one or more dark stripes; dorsum otherwise with obscure, close-meshed dark brown or black reticulation not broken by pale lines; mandible with two small basal teeth.

Described from four alcoholic larvae from Arlington, Va., reared to maturity June–July 1948, by J. G. Franclemont.

*Distribution.*—New York, Pennsylvania, Maryland, Virginia, North Carolina, Tennessee, and Georgia.

*Food plant.*—Black locust (*Robinia pseudacacia*) (teste Franclemont). The normal food plant may be some leguminous herb.

#### CAENURGINA, CAENURGIA, AND PTICHODIS

1. With a white stripe midventrally including a dark median line. Pale longitudinal area between setigerous tubercle II and III obliterated by dark markings on anterior abdominal segments. Spiracles brown.

*Ptichodis kma*

With a narrow, black midventral stripe usually pale medially. Longitudinal pale area between II and III as distinct on anterior abdominal segments as elsewhere..... 2

2. The ventral coloration uniform, without stripes except the midventral, made up of slender, evenly spaced parallel lines. With a slender pale line dorsal of the ocelli. Spiracles brown..... *Caenurgia chloropha*

The ventral coloration made up of dark stripes: One including setigerous tubercles V and VI and a less evident stripe including the VII group of setigerous tubercles on anterior abdominal segments in addition to the midventral. With a white stripe dorsad of the ocelli. Spiracles yellowish or white. ----- *Caenurgina erectea*, *Caenurgina crassiuscula*

### CAENURGINA Wlk.

#### CAENURGINA CHLOROPHA (Hbn.) (CONVALESCENS Wlk.)

(Teste J. G. Franclemont)

Head 2.4 to 2.6 mm. broad. Body about 35 mm. long and 3 mm. broad at middle, tapering distinctly posteriorly; skin smooth; general color pale gray, possibly varying to darker forms as in some related species.

The dorsal coloration, to and including the subventral pale stripe, essentially the same as that of *Caenurgina erectea* except that the spiracles are brown in *chloropha*. The ventral coloration is uniform, without stripes except a narrow black midventral stripe including a median pale line, and is composed of parallel, evenly spaced, slender, dark, longitudinal lines. Setigerous tubercles minute throughout.

Head coloration as in *Caenurgina erectea* except that the pale stripe dorsad of the ocelli in *erectea* is reduced to a line in *chloropha*. The mandible structure is the same in both.

Described from four alcoholic larvae from Arlington, Va., reared to maturity August-September 1949, by J. G. Franclemont.

*Distribution*.—New York, Pennsylvania, Virginia, North Carolina, Tennessee, Georgia, and Florida.

*Food plant*.—Vetch (teste Franclemont).

### CAENURGINA McD.

#### CAENURGINA ERECTEA (Cram.) and

#### CAENURGINA CRASSIUSCULA (Haw.)

Head 2.6 to 3 mm. broad. Body about 35 mm. long and 3.5 mm broad at middle, tapering strongly posteriorly; skin smooth, general color varying from very pale gray through infuscated brown to nearly black.

There is considerable variation in details and in the intensity of the coloration even among progeny of a single moth. There are prominent pale brownish or pinkish stripes middorsally, subdorsally and subventrally and the longitudinal area between setigerous tubercles II and III is pale with a subdued median dark stripe and all marking in this area are as clear on anterior abdominal segments as elsewhere but all pale stripes may be obscured by infuscation in the more deeply colored specimens. The dark stripe including I and II and that including III and the spiracles each is composed of three parallel dark lines. Spiracles yellow or white. The dark ventral coloration composed of a stripe including V and VI, a less evident stripe including the VII group on anterior abdominal segments and a narrow midventral stripe which may be pale medially. Setigerous tubercles minute throughout. Head smooth, the dark dorsal coloration extending to well ventrad of the ocelli and composed of parallel longitudinal lines; the intervening pale areas including front, adfrontal areas, median line, a stripe dorsad of the ocelli and a stripe bordering the black ventral coloration; mandible with two small, obscure basal teeth.

The writer has found no characters for separating these two species.

Larva of *erectea* described from four sets of larvae reared from eggs obtained from officially determined moths at Clarksville, Tenn., in September, and at Lafayette, Ind. (H. Fox), in June, and numerous larva collected in Washington and Oregon from June to October.

Larva of *crassiuscula* described from three sets of larvae reared from eggs obtained from officially determined moths at Clarksville, Tenn., in October, and at Lafayette, Ind., in June (H. Fox).

*Distribution of erectea*.—United States: Maine, New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, Maryland, North Carolina, Tennessee, Illinois, Indiana, Iowa, Minnesota, Texas, New Mexico, Kansas, Nebraska, South Dakota, Colorado, Utah, Montana, Oregon, and Washington. Canada: Manitoba, Saskatchewan, Alberta, and British Columbia.

*Distribution of crassiuscula*.—United States: Maine, Massachusetts, Pennsylvania, Ohio, Indiana, Illinois, Minnesota, North Carolina, Tennessee, Georgia, Texas, New Mexico, Arizona, Kansas, Nebraska, Colorado, Utah, California, and Montana. Canada: Alberta.

*Food plants*.—Clover, lupine, and grasses.

### PTICHODIS Hbn.

#### PTICHODIS LIMA (Gn.)

Head 2.6 to 2.7 mm. broad. Body about 35 mm. long and 4 mm. broad at middle, tapering distinctly posteriorly; skin smooth; general color varying from gray to infuscated brown.

Coloration of body essentially the same as in *Caenurgina erectea* except in the following particulars: Spiracles brown. A white stripe midventrally including a median dark line. The dark lines in the longitudinal pale area between setigerous tubercles II and III fully developed and obliterating the pale area posteriorly on abdominal segment 1, on 2, and anteriorly on 3. In *Caenurgina erectea* and *Caenurgina chloropha* these lines are faint or absent except in occasional patches. Head coloration and structure the same as in *Caenurgina erectea*.

Described from four alcoholic larvae from Arlington, Va., reared to maturity July–August 1949, by J. G. Franclemont.

*Distribution*.—New York, Pennsylvania, Virginia, Georgia, and Florida.

*Food plant*.—Bush clover (*Lespedeza violacea*) (teste Franclemont).

### MOCIS Hbn.

#### MOCIS DISSEVERANS (Wlk.)

Head 3 mm. broad. Body about 40 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color pale with two dorsal stripes and the venter dark.

A pale middorsal stripe including a geminate brownish line bordered by strong, continuous dark stripes including setigerous tubercles I and II and intensified at juncture of abdominal segments 1–2 and 2–3. Ventrad of this to III pale with a median band of reddish lines. The area from III to and including the spiracles occupied by a darker band including longitudinal pale lines. A white subventral stripe bordered ventrally by a dark stripe extending upon the bases of the legs and prolegs. The venter with three dark stripes, the median much the most prominent. Spiracles pale brownish. Head smooth, the coloration composed of alternating dusky and pale stripes; the pale areas including a stripe bordering the adfrontal areas and the median line, a stripe dorsad of the ocelli and a narrow stripe including ocelli IV and VI; ventral surface black.

Described from seven inflated larvae in U. S. National Museum labeled "Palm Beach, Fla., coll. H. G. Dyar," and several alcoholic specimens in the National Museum labeled "In grass, March 1923, Bans, Cuba, J. R. Johnson coll." The writer has found no difference between

these larva and others said to be *Mocis latipes* (Gn.) collected in Panama in September-October 1923, by Zetek.

*Distribution.*—Florida, Cuba.

*Food plants.*—Grasses.

### CATOCALINAE, Group 3

1. Mandible with a conspicuous basal process on oral face, bearing an apical molar area..... 4  
Mandible without a basal tooth or process on oral face..... 2
2. All setigerous tubercles minute, mere setal insertions, except II on abdominal segments 8 and 9. Seta VIII on thorax very short and broad at base, almost conical (pl. 7, S). Of eastern distribution..... *Allotria*  
Setigerous tubercle II, at least, moderately large on anterior abdominal segments and particularly large on abdominal segment 8. Seta VIII on thorax comparatively long and slender, setiform. Of western distribution..... 3
3. Setigerous tubercle II on abdominal segment 1 large, prominent, short-cylindrical with a rounded, blunt apex. Spiracles very large; height of spiracle on abdominal segment 2 equal to nearly three times the distance between the spiracle and seta III (28:10)..... *Zuleops*  
Setigerous tubercle II on abdominal segment 1 of but moderate size and but slightly elevated. Height of spiracle on abdominal segment 2 at most but slightly greater than the distance between the spiracle and seta III (17:14).  
*Yrias*
4. Arrangement of setigerous tubercles of the VII group much the same on abdominal segments 1 and 2, VII<sup>a</sup> being distinctly anterior to the transverse line of VII<sup>c</sup> on both segments..... 5  
Arrangement of the setigerous tubercles of the VII group much different on abdominal segment 2 from that on 1, VII<sup>a</sup> not being anterior to the transverse line of VII<sup>c</sup> on 2..... 7
5. With a fringe of fleshy filaments along sides of venter as in some *Catocala*. Setigerous tubercle VII<sup>b</sup> on abdominal segments 1 and 2 slightly dorsal of the longitudinal line of VII<sup>a</sup>. Setigerous tubercle VII<sup>c</sup> bearing a seta on 1 and 2. Without a basal protuberance on the prolegs..... *Heteranassa*  
Without a fringe of fleshy filaments along sides of venter. Setigerous tubercle VII<sup>b</sup> somewhat ventrad of the longitudinal line of VII<sup>a</sup>..... 6
6. With a subconical protuberance basally on outer face of abdominal prolegs (pl. 10, N). Setigerous tubercle VII<sup>c</sup> on abdominal segments 1 and 2 bearing a minute, fleshy cone. Cutting margin of mandible with an obscure tooth at dorsal margin and an obscure submedian tooth with a long, marginal, molar area on each side of it. Setigerous tubercle II on 8 small and inconspicuous..... *Panopoda*  
Without a protuberance on outer face of prolegs. Setigerous tubercle VII<sup>c</sup> on abdominal segments 1 and 2 bearing a normal seta. Cutting margin of mandible toothless, thin, without marginal molar areas. Setigerous tubercle II on abdominal segment 8 large, conspicuous, the dorsal length equal to more than the height of the spiracle on this segment (50:42)-- *Strenoloma*
7. Setigerous tubercle II on abdominal segment 8 very large and strongly elevated. Setigerous tubercle VIII on abdominal segment 8 bearing a seta. With a fourth seta in the VII group on the antero-lateral face of the abdominal prolegs (a unique character)..... *Safia*  
Setigerous tubercle II on 8 minute, a mere setal insertion. Setigerous tubercle VIII on 8 without a seta. With but the usual three setae in the VII group on the abdominal prolegs..... *Otocema*

### ALLOTRIA Hbn.

#### ALLOTRIA ELONYMPHA (Hbn.)

The following color description is drawn from an immature inflated specimen (head 2.9 mm. broad), while the measurements are from a decolorized alcoholic specimen.

Head 3.4 mm. broad. Body about 40 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin smooth; general color pale gray with a pinkish tinge.

The pale middorsal stripe expanded on anterior half of abdominal segments forming a large spot overlaid with pinkish reticulation on anterior segments but white posteriorly. A subdued, broken, dark stripe including setigerous tubercles I and II made up of dark reticulation; the dark color somewhat intensified posteriorly on abdominal segment 4 and throughout on 5. An obscure band of pinkish or infuscated pinkish reticulation between II and III. An obscure, sinuous, dark stripe including III and the spiracles. Spiracles brown or infuscated brown. An obscure pale subventral stripe margined ventrally by dark reticulation. Midventer white with reddish spots anterior to the prolegs. Setigerous tubercles minute except II moderately large on 8 and 9. Head with slender pinkish or infuscated pinkish reticulation, a dark line just dorsad of the ocelli.

Described from one inflated larva collected at Lakehurst, N. J., July 10, by Charles Rummel, and one alcoholic specimen reared to maturity at Arlington, Va., July 1949, by J. G. Franclemont.

*Distribution*.—Georgia, North Carolina, Tennessee, Virginia, New Jersey, Pennsylvania, and New York.

*Food plants*.—Black gum (*Nyssa sylvatica*) (teste Franclemont); also reported feeding on hickory and walnut.

### ZALEOPS Hamp.

#### ZALEOPS UMBRINA (Grt.)

Head 2.7 mm. broad. Body about 30 mm. long and 3 mm. broad at middle, tapering strongly posteriorly with a prominent dorsal hump on abdominal segment 8; skin smooth; general color blackish.

The subdued, pale middorsal stripe and the irregular black stripe including setigerous tubercles I and II traceable but other markings obscure or obsolete except that the pale stripe between II and III forms a pale spot tinged with orange on abdominal segment 1 and a pale spot on 8. Spiracles infuscated smoked-pearl gray. Dorsal coloration extending to base of prolegs, the flecks of color becoming more purplish ventrally. Venter narrowly white laterally, black medially. Setigerous tubercle I to V small except that II on 1 is prominent, short-cylindrical with a rounded blunt apex while on 8 this tubercle is extremely large, slenderly conical and set on a hump. Head pale with very close black reticulation, the interstices appearing as minute, round, pale dots; seta P<sup>3</sup> on a strong, rounded protuberance.

Described from one larva collected near Superior, Ariz., May 6, 1938, from which a moth was obtained July 6, 1938, and was determined by Clarke.

*Distribution*.—Arizona and Texas.

*Food plant*.—Catclaw (*Acacia greggii*).

### YRIAS Gn.

1. Abdominal segment 4 with a black saddle extending across dorsum and nearly to the spiracles laterally, becoming brownish laterally. Head heavily marked with black.----- *volucris*  
Abdominal segment 4 without a black saddle. With a transverse brown or dark brown spot dorsally posterior to II on abdominal segment 2.----- 2
2. Head marked with brown anteriorly, closely reticulate with black posteriorly. General color of body whitish gray or dark gray.----- *crudelis* (?)  
Head very closely reticulate with ferruginous. General color of body pure white.----- *repentis*

#### YRIAS VOLUCRIS Grt.

Head 1.9 mm. broad. Body about 30 mm. long and 3 mm. broad, slender and tapering strongly posteriorly; skin smooth; general color pale gray to dark gray.

The distinguishing characters are a black mark dorsad of setigerous tubercle II and another posterior to II on abdominal segment I, with a pale area anterior

to these, and a black saddle on 4 extending across the dorsum nearly to the spiracles and becoming brownish ventrally. The white middorsal stripe includes a purplish line and tends to include a small black spot on each abdominal segment. The pale stripe between II and III, a dark stripe including III and the spiracles, and a narrow, sinuous, subventral stripe are present but often obscure. Spiracles pale brown. Body to base of prolegs with purplish lines. Venter white with a slender purplish median line. Setigerous tubercles small except II which is somewhat elevated throughout and larger on 8 and 9. Head white, heavily marked with black, intermingled with purplish anteriorly; a paler area posterior to the ocelli.

Described from about 40 larvae collected near Hillside, Ariz., May 17, 1938. Moths emerged late in June, and were determined by Clarke.

*Distribution*.—Arizona and Texas.

*Food plant*.—Catclaw (*Acacia*).

#### YRIAS CRUDELIS Grt. (?)

Head 2 mm. broad. Body about 25 mm. long and 2.5 mm. broad at middle, slender and tapering strongly posteriorly; skin smooth; general color whitish gray sometimes tinged faintly with purplish.

Middorsal pale stripe indistinct on median abdominal segments except near juncture of segments. Stripe including setigerous tubercles I and II composed of sparse black dots, seldom conspicuous, fused across the dorsum on abdominal segment 2 to form a small black spot tinged with brown. Pale stripe between II and III indicated. A stripe composed of black dots including III and the spiracles margined ventrally by the narrow, sinuous, white subventral stripe. Spiracles dark brown. A purplish stripe above base of legs and prolegs venter purple laterally, greenish white medially with a slender green midventral line and small dark purplish spots. Setigerous tubercles small except II which is somewhat elevated throughout and especially on 8 and 9. Head white marked closely with black posteriorly, brownish anteriorly.

Described from 20 larvae collected 8 miles west of Hillside, Ariz., on the road to Kingman, May 17, 1938. A black moth, probably slightly larger than *repentis*, emerged from this material but escaped. Mr. Clarke is of the opinion that it was *crudelis*.

*Distribution*.—Texas, Arizona, and California.

*Food plant*.—Catclaw (*Acacia*).

#### YRIAS REPENTIS (Grt.)

Head 1.9 mm. broad. Body about 25 mm. long and 2.5 mm. broad at middle, very slender and tapering strongly posteriorly; skin smooth; general color pure white with slender, dark brownish longitudinal lines.

Middorsal stripe white with traces of a dark purplish median line. The slender, dark brownish stripe including setigerous tubercles I and II fused across the dorsum on abdominal segment 2 forming a small transverse spot. The stripe between II and III white, including two slender purplish lines. The stripe including III and the spiracles dark brownish. Spiracles brown. Subventral stripe white, sinuate on ventral margin and bordered ventrally by a purplish stripe. Venter purplish laterally, greenish white medially with a segmental series of very small, dark spots. Setigerous tubercles I to IV small except that II is rather large on abdominal segments 7, 8, and 9. Head strongly arched on occiput, face flat, ground color white, closely marked with ferruginous.

Described from 10 larvae collected 8 miles west of Hillside, Ariz., May 17, 1938. A moth emerged June 25, 1938, and was determined by Clarke.

*Distribution*.—Arizona and Texas.

*Food plant*.—Catclaw (*Acacia*).

## HETERANASSA Sm.

## HETERANASSA MIMA (Harv.)

Head 2.2 to 2.6 mm. broad. Body about 33 mm. long and 3.5 mm. broad at middle, tapering strongly posteriorly; venter bearing fleshy lateral filaments; skin smooth; general color running the gamut in shades of green through grays to black.

This larva not only is extraordinarily variable in general color but in markings and spiracle color as well. The spiracles vary from white through intermediate shades to black; the middle of the venter through shades of green to black while the sides of the venter may be greenish or white. In rearing, the writer segregated eight types of larvae which appeared to represent different species.

Under these conditions a detailed description would be more confusing than helpful, but this species may be distinguished at once from any other phalaenid larva known to the writer owing to the presence of fleshy lateral filaments (as in some *Catocala*) on the venter coupled with the absence of a seta on tubercle VIII on abdominal segments 1 and 2.

Described from numerous larvae collected near Superior, Ariz., and Hillside, Ariz., the earlier part of May 1938. Twenty-one moths emerged from late in May to the middle of July, and were determined by Clarke.

*Distribution.*—Arizona, Texas, and Florida.

*Food plants.*—Mesquite (*Prosopis*), occasionally catclaw (*Acacia*).

## PANOPODA Gn.

## (SIAVANA Wlk.)

## PANOPODA RUFIMARGO (Hbn.)

Head 3.7 to 4 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering distinctly posteriorly; skin smooth; general color green closely irrorate with reddish.

Middorsal pale line barely indicated. A pale line somewhat ventrad of setigerous tubercle II may be strong, faint, or absent. No other markings. Spiracles orange or yellow with brown rim. Dorsal setigerous tubercles small and inconspicuous but somewhat more than mere setal insertions. Head green irrorate with reddish, either with or without an anteriorly-convex, yellowish transverse line including setae P<sup>1</sup>; cutting margin of mandible strongly curved with an obscure tooth at dorsal margin and another medially, the latter between two long marginal molar areas.

Described from four inflated larvae from the U. S. National Museum labeled, respectively, "Sept. 29, 1874," "From Prof. C. V. Riley, Atlanta, Ga., Sept. 9, 1878, 3574," and "Oak, Aug. 25, 1884, 3574." Franclemont determined a moth associated with these larvae as a female of typical *rufimargo*. The specimen upon which Dr. Dyar based his description of the larva of *Siavana repanda* Walk. has been examined and seems to be identical with that of *Panopoda rufimargo*. Franclemont agrees that *Siavana* and *Panopoda* are not generically distinct and that the two "species" are extremely close, at best.

*Distribution.*—(*Panopoda rufimargo*) Texas, Mississippi, Georgia, Florida, North Carolina, Tennessee, New Jersey, Iowa, Pennsylvania,

Illinois, Missouri, Minnesota, New York, New Hampshire, Connecticut, and Massachusetts. (*Siavana repanda*) Texas, Georgia, and Florida.

*Food plant*.—Oak.

### STRENOLOMA Grt.

#### STRENOLOMA LUNILINEA (Grt.)

Head 3.2 to 3.3 mm. broad. Body about 35 mm. long and 3.5 mm. broad at middle, tapering posteriorly; skin smooth; general color gray.

Coloration of body made up of longitudinal stripes composed of dark to black flecks alternating with stripes of the whitish ground color. Middorsal pale stripe broad, rather strongly constricted between setigerous tubercles I and II particularly on abdominal segments 2, 3, and 4. Dark stripe including I and II with dorsal margin strongly sinuous and ventral margin straight, the dark color much more intense posterior to II on each segment. The longitudinal area ventrad of this to but not including III occupied by a broad stripe of the pale ground color including a medium dark stripe which may be tinged with purplish. A narrow dark stripe including III and the spiracles margined ventrally by the pale subventral stripe. Spiracles black. Midventer white. Cervical and anal shields white, the setigerous tubercles black. Setigerous tubercles to VI of moderate to large size, II on 8 white or orange, very large, the dorsal length greater than the height of the spiracle on this segment (50:40). Head with front, adfrontal areas, a curved mark including seta P<sup>1</sup>, and a spot posterior to L<sup>1</sup>, pale; most of remainder of head dark, closely marked with pale freckles.

Described from six alcoholic larvae reared to maturity at Arlington, Va., September–October 1949, by J. G. Franclemont.

*Distribution*.—Mississippi, Georgia, North Carolina, Tennessee, Virginia, Maryland, Pennsylvania, and Illinois.

*Food plant*.—Honeylocust (*Gleditsia triacanthos*).

### SAFIA Gn.

1. Markings of body made up of continuous sinuous black lines. Black markings of head confined almost entirely to rounded spots at the setae---- *bilineata*  
 Markings of body made up of small black flecks. Head much more heavily marked with black and without isolated black spots at the setae---- *amella*

#### SAFIA BILINEATA (Sm.)

Head 4.9 mm. broad. Body about 50 mm. long and 6 mm. broad at middle, tapering posteriorly; skin smooth; general color apparently pale overlaid with black lines.

The usual black stripes, one including setigerous tubercles I and II and the other including III and the spiracles, not developed; the body tending to be rather uniformly marked, except ventrally, with sinuous black lines except that these are largely obliterated dorsally on abdominal segments 1, 2, 5, and 6. Middorsal pale stripe margined by black lines which are far apart and constricted or joined on each abdominal segment thus forming a median spot and an intersegmental spot at each end. Spiracles brown. Subventral pale stripe margined by black lines and more or less obliterated by dark markings just ventrad of the spiracles. Venter with large purplish black median spots. Setigerous tubercles I and II small to minute except on 8 and 9; II very large and strongly elevated on 8, the dorsal length equal to twice the spiracle height on this segment (100:48), VI throughout encircled at a distance by a black line. Head apparently uniform pale brown with rounded black spots at the setae, two squarish black spots near and slightly dorsad of seta A<sup>2</sup>, a black line originating ventrad of seta O<sup>2</sup> and extending to posterior margin of head and two short black dashes dorsad of this at posterior margin.

Described from two alcoholic larvae in the U. S. National Museum labeled "On Texas ebony foliage (*Siderocarpus flexicaulis*), Brownsville, Tex., 14 June, 1939, Lot 39, 10167."

*Distribution*.—Texas.

*Food plant*.—Texas ebony (*Siderocarpus flexicaulis*).

#### SAFIA AMELLA (Gn.)

Head 4.2 to 4.3 mm. broad. Body about 55 mm. long and 6 mm. broad at middle, tapering posteriorly; skin smooth; general color probably pale, overlaid closely with small black flecks.

The usual black stripes, one including setigerous tubercles I and II, the other including III and the spiracles, indicated on some posterior abdominal segments only; the body being closely marked with small black flecks even in the paler dorsal areas on abdominal segments 1, 2, 5, and 6. The middorsal pale stripe largely obliterated, filled with black flecks and mostly parallel-margined where indicated. Pairs of rather large black spots contiguous to the middorsal pale stripe at posterior margin of abdominal segment 1, at anterior and posterior margins of 2 and at anterior margin of 3. Spiracles brown. No subventral pale stripe indicated. Venter of dilute dorsal coloration with large dusky purplish blotches between the legs and prolegs. Setigerous tubercles small to minute except on 8 and 9; II very large on 8, the dorsal length much greater than height of spiracle on this segment (60:42), VI not encircled by a black line. Head pale or pale brown, a transverse band of irregular black spots from the ocelli across the front, a large area posterior to the ocelli bearing black spots and reticulation, an irregular black spot laterad of seta P' and an irregular black area along the median line.

Described from two inflated larva in the U. S. National Museum labeled "On live oak, Florida, May 1880, A. Koebele coll."

*Distribution*.—Florida, Georgia, and Texas.

*Food plant*.—Live oak (*Quercus virginiana*).

#### OTOSEMA Hbn.

##### OTOSEMA ODORA (L.)

Head 5.1 mm. broad. Body about 70 mm. long and 11 mm. broad, tapering somewhat posteriorly; skin smooth; general color dark gray tinged with brown.

Coloration both dorsally and ventrally composed of small dark spots placed so close together that the intervening ground color appears as a close-meshed pale reticulation; the spots blackish dorsally and apparently tinged with brown and pinkish ventrally.

Middorsal pale stripe broad, of very irregular width, strongly expanded on abdominal segments 2 and 7 where it tends to obliterate the black stripe including setigerous tubercles I and II, the color of which is intensified on 1 where the black stripes invade the middorsal pale stripe. A more slender, sinuous, broken black stripe including III and the spiracles. Spiracles black at centre, with gray margin and black rim. Large purplish black spots midventrally. Setigerous tubercles minute throughout. Head smooth, front and a broad band including the ocelli and extending as a narrow margin along posterior margin of head, pale; remainder of head black.

Described from three inflated larvae in the U. S. National Museum labeled "Misantla, Mexico, No. 36." Comstock (♀) gives an account of this species, as it occurs in southern California, with excellent photographs.

*Distribution*.—California (and probably other southern States) southward into South America; northward to Canada as strays.

*Food plants*.—Catclaw (*Acacia decurrens*) (Comstock); also reported as feeding on: *Cassia fistula*, Kentucky coffeetree (*Gymnocladus*), *Pithecolobium*, and *Saman*.

## CATOCALINAE, Group 4

1. Arrangement of the setigerous tubercles of the VII group the same on abdominal segments 1 and 2, with VII<sup>a</sup> far anterior to the transverse line of VII<sup>c</sup> on both segments (pl. 4, K)----- 3
- Arrangement of the setigerous tubercles of the VII group different on abdominal segment 2 from that on 1, with VII<sup>a</sup> but slightly, if at all, anterior to the transverse line of VII<sup>c</sup> on 2 (pl. 4, L)----- 2
2. Emargination in anterior margin of labrum very narrow, slotlike, depth of emargination equal to approximately three-fourths length of labrum (35:50) (pl. 10, J). Ocelli IV and VI but very slightly more than the width of IV apart (16:15). Seta V very short on mesothorax and metathorax, the length equal to but one-fourth the height of the spiracle on abdominal segment 1 (10:43)----- *Euparthenos*
- Emargination in anterior margin of labrum usually broad, the depth, at most, equal to but half length of labrum (pl. 10, E, F, K). Ocelli IV and VI distinctly more than the width of IV apart (14:10). Seta V on mesothorax and metathorax long, the length equal to the height of the spiracle on abdominal segment 1 or somewhat more----- *Parallelia, Zale*
3. Oral face of mandible with two or three small, acute teeth on the base and without a basal process or molar area. Without an elevation middorsally on abdominal segment 5 or a subventral fringe of fleshy filaments. Occurs in the Southwestern and Pacific Coast States. Feeds on snowberry (*Symphocarpus*)----- *Towocampa*
- Oral face of mandible with a basal process usually bearing an apical molar area (pl. 11, Q). Body often with an elevation middorsally on abdominal segment 5 and a subventral fringe of fleshy filaments. Of general distribution. Food plants do not include snowberry----- *Catocala*

## EUPARTHENOS Grt.

## EUPARTHENOS NUBILIS (Hbn.)

Head 3.8 to 4.1 mm. broad. Body about 50 mm. long and 6 mm. broad at middle, tapering posteriorly; skin smooth; general color gray or brownish.

Dorsum to base of prolegs, including the dorsal pale spots, reticulate with infuscated brown on a pale or yellowish ground. Middorsal pale stripe expanded on each abdominal segment forming a large ovoid pale area nearly or quite obliterating the dark stripe including setigerous tubercles I and II on some anterior segments. Dark stripe including I and II more intensely pigmented on posterior segments. The usual pale stripe between II and III, the dark stripe including III and the spiracles and a narrow, pale subventral stripe, are present. Spiracles brown, extremely large. Venter pale reticulate with reddish and with a dark midventral stripe. Setigerous tubercles minute. Head with dark submedian arcs and close dark reticulation, the pale ground color appearing as groups of small pale spots; labrum with a narrow, almost parallel-sided anterior emargination extending three-fourths the length (pl. 10, J).

Described from 5 inflated larvae, one of which is labeled "Hillside, N. J., June 30" from Chas. Rummel; 1 inflated larva without data from the Brooklyn Museum from Chas. Schaeffer; and 2 alcoholic specimens collected at Silver Spring, Md., September 10, 1937, by J. F. Gates Clarke.

*Distribution.*—United States: Mississippi, Tennessee, North Carolina, Maryland, Pennsylvania, New Jersey, New York, Massachusetts, Kansas, Iowa, and Wisconsin. Canada: Ontario.

*Food plant.*—Black locust (*Robinia pseudacacia*).

## ZALE Hbn.

## PARALLELIA Hbn.

As indicated in the first couplet of the following key, the differences between the conifer-feeders and the other species of *Zale* would seem

to be of generic importance, *Phaeocyma* Hbn. probably being available for the conifer-feeding species.

The usual catocalinid colorational pattern is present in these larvae, but is obscure or subdued owing to intrusion of the darker reticulation into the paler areas except in the species tentatively determined as *Zale lunifera*. *Zale lunata* is the only species in which more than a few larvae have been available for examination and *lunata* has been found to be so highly variable in general color and distinctness of the markings that a detailed description would be more confusing than helpful. Considering the probability that similar variation is found in the other species, only such details as may be distinctive are included in the following characterizations of the species.

The "intersegmental area" is a pale yellowish or orange dorsal spot between abdominal segments 1 and 2, concealed except when the body is fully extended and extending anteriorly to ventrad of setigerous tubercle II in some species.

#### KEY to ZALE including PARALLELIA BISTRIARIS Hbr.

1. Labrum very slightly lobed anteriorly, the anterior and posterior margins nearly parallel (pl. 10, K). Height of prothoracic spiracle decidedly greater than that of the spiracle on abdominal segment 8 (35:30). Mandible without a basal process. Feed on coniferous trees..... 2
- Labrum strongly lobed anteriorly, the anterior and posterior margins far from parallel (pl. 10 E, I). Height of prothoracic spiracle equalling or less than height of spiracle on abdominal segment 8. Mandible with a basal process bearing an apical molar area. Do not feed on coniferous trees..... 5
2. Spiracles white. With solid white stripes middorsally and well ventrad of setigerous tubercle II, the middorsal stripe not expanded immediately posterior to the line of setigerous tubercles II on abdominal segments 4, 5, and 6. Dorsal length of setigerous tubercle II on abdominal segment 8 much less than the height of the spiracle on this segment "*lunifera*" Spiracles brown or black. Stripes obscure, overlaid with or composed of reticulation, the middorsal pale stripe strongly broadened immediately posterior to the transverse line of setigerous tubercles II on abdominal segments 4, 5 and 6. Dorsal length of II on 8 at least equal to the height of the spiracle on this segment..... 3
3. Dorsal reticulation of body mostly dark. A black line immediately dorsad of the ocelli continued across the occiput as a band of dark reticulation... 4  
Dorsal reticulation of body mostly red. No black line dorsad of the ocelli. *duplicata*
4. Intersegmental dorsal pale areas between abdominal segments 1 and 2, and 2 and 3 not developed. Dorsal length of setigerous tubercle II on abdominal segment 8 approximately equal to the spiracle height on this segment (32:29)..... *squamularis, obliqua*
- Intersegmental dorsal pale areas between abdominal segments 1 and 2 and 2 and 3, large, conspicuous. Dorsal length of setigerous tubercle II on 8 much greater than the height of the spiracle on this segment (53:31). *metata*
5. Dorsal length of setigerous tubercle II on abdominal segment 8 at most but slightly exceeding the height of the spiracle on this segment (30:28). Middorsal pale stripe approximately parallel margined on abdominal segments 4, 5, and 6 or somewhat broadened at posterior margin of segments only. 6  
Dorsal length of setigerous tubercle II on abdominal segment 8 much greater than height of spiracle on this segment (46:35 or more). Middorsal pale stripe abruptly, strongly broadened immediately posterior to the transverse line of setigerous tubercles II on abdominal segments, 4, 5, and 6..... 11
6. Line P<sup>1</sup>-P<sup>1</sup> at or below apex of adfrontal areas..... 7  
Line P<sup>1</sup>-P<sup>1</sup> well above apex of adfrontal areas..... 8

7. Notch in anterior margin of labrum narrowly V-shaped and extending more than half way to the base (10:17). A black line arising anterior to the spiracle and extending across dorsum posterior to setigerous tubercles II on abdominal segment 8. Middorsal pale stripe not as below. Distribution east of the Rocky Mts.----- *Parallelia bistriaris*
- Notch in anterior margin of labrum broad and extending one-third the way to the base (5:14). No black transverse line posterior to setigerous tubercles II on 8. Middorsal pale stripe so filled with brownish except at margins as to give the appearance of a geminate white line. Found in Arizona, Nevada and California.----- *rubi*
8. Reticulation of head and body dark.----- 9
- Reticulation of head and body mostly red.----- *cingulifera*
9. Spiracles black.----- *unilineata*
- Spiracles brown.----- 10
10. Emargination in anterior margin of labrum narrowly V-shaped (pl. 10, I). Height of front and length of median line approximately in the proportion of 30:44. Spots between prolegs black.----- *undularis*
- Emargination in anterior margin of labrum broadly V-shaped (pl. 10, E). Height of front and length of median line approximately in the proportion of 30:55. Spots between prolegs purplish black.----- *galbanata*
11. Front high and narrow, the basal width decidedly less than the height (30:40); width of head 3.5 to 3.7 mm. in mature larva. Spiracles usually pearl gray or blackish. No transverse ridge connecting setigerous tubercles II on abdominal segment 1. Of general distribution.----- *lunata*
- Front shorter, the basal width nearly equal to the height (32:35).----- 12
12. Setigerous tubercle II smaller on abdominal segment 8, the dorsal length and height of spiracle on this segment in a proportion of approximately 40:35. No transverse ridge between setigerous tubercles II on abdominal segment 1. Spiracles brown in the one specimen at hand. Distribution east of the Rocky Mountains.----- *horrida*
- Setigerous tubercle II distinctly larger on abdominal segment 8, the dorsal length of the tubercle and the height of the spiracle on this segment approximately in a proportion of 70:38. A low, narrow, transverse ridge often present between setigerous tubercles II on abdominal segment 1. Spiracles often pearly gray or blackish. Head of mature larva 3.7 to 4.0 mm. broad. Of general distribution.----- *minerea*

## PARALLELIA Hbn.

## PARALLELIA BISTRARIIS Hbn.

The adult of *Parallelia bistriaris* has been associated with such genera as *Cacnurgina* and *Mocis*, which it resembles, but the affinities of the larvae seem to be with *Zale*, the structural similarity being so close that the writer has found no satisfactory characters for separating these two genera.

Head 3 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color apparently brownish or gray.

Middorsal pale stripe more evident on thorax, obscure and broken elsewhere. A large, pale dorsal area on abdominal segment 1. A black, curved line arising anterior to the spiracle and crossing the dorsum immediately posterior to setigerous tubercles II on abdominal segment 8. The usual dark stripe including I and II and that including III and the spiracles scarcely indicated. Spiracles apparently dusky gray or black. Subventer to base of prolegs with dark flecks and reticulation. Midventer pale with dark purplish spots between the prolegs and a purplish stripe on 7, 8, and 9. Setigerous tubercles minute except II on 8 and 9 where the tubercle is small, inconspicuous and but slightly elevated.

Head pale, reticulate with red, with black lines margining the median line, one including setae A<sup>1</sup> and P<sup>1</sup>, a third straight line including A<sup>2</sup> and extending to posterior margin of head, and a fourth dark line on ventral surface extending to posterior margin of head.

Described from one inflated larva in the U. S. National Museum labeled "July 22, 1882, on maple, A. Koebel," and one alcoholic larva

collected at Cherryfield, Maine, in August 1938 on sprouts of *Acer rubrum* by A. E. Brower.

*Distribution.*—United States: Florida, Georgia, North Carolina, Maryland, New Jersey, Pennsylvania, Kansas, Missouri, Illinois, New York, and Maine. Canada: Nova Scotia and Quebec.

*Food plant.*—Maple.

#### ZALE LUNIFERA Hbn. (?)

The writer has examined larvae, apparently of this species, labeled as *galbanata* and *obliqua* and a larva in the National Museum bears an old label: "This is evidently *Phacocyma lunifera* Hbn." These specimens are not *galbanata* nor are they *obliqua* unless the earlier instars of *obliqua* differ decidedly in coloration from the later instars. Dr. J. F. Gates Clarke states that none of the larvae in the National Museum can be associated with reared moths and, apparently, the identity of the species must remain in doubt until someone rears it.

Head 2.9 mm. broad. Body about 35 mm. long and 4.5 mm. broad at middle. Distinguishable at once from any other species of *Zale* known to the writer owing to the presence of sharply defined, nearly parallel-sided white middorsal, subdorsal and subventral stripes, alternating with well-defined brownish or reddish stripes. Setigerous tubercle II on abdominal segment 8 quite small, attached to the dorsum for the entire length and very slightly elevated posteriorly; the dorsal length (anterior margin to seta) less than height of spiracle on this segment (16:22).

Head reticulation mostly red; labrum scarcely lobed anteriorly; width of front approximately equal to the height (29:30); height of front decidedly less than length of median line (30:48).

Described from several inflated larvae in the U. S. National Museum at least one of which is labeled "*Pinus strobus*, N. H., July 23, 1883, Prof. Riley," and two inflated specimens, without data, received from the Brooklyn Museum through the kindness of Geo. P. Engelhardt.

*Distribution.*—Florida, Georgia, Texas, Oklahoma, Kansas, Iowa, Illinois, Minnesota, Ohio, North Carolina, Maryland, Pennsylvania, New York, Massachusetts, and New Hampshire.

*Food plant.*—White pine (*Pinus strobus*).

#### ZALE DUPLICATA (Beth.)

Head 2.9 mm. broad. Body about 30 mm. long and 5 mm. broad at middle. Middorsal pale stripe broadened just posterior to a transverse line which would connect setigerous tubercles II on abdominal segments 3, 4, 5, and 6. A small but distinct intersegmental area. Setigerous tubercle II on 8 attached to the dorsum for the entire length but somewhat elevated posteriorly; the dorsal length (anterior margin to seta) somewhat greater than height of spiracle on this segment (30:26).

Head reticulation nearly entirely red; labrum scarcely lobed anteriorly, very broadly, shallowly emarginate anteriorly; basal width of front approximately equal to the height (28:29); height of front decidedly less than length of median line (29:53).

Described from two inflated larvae, without data, received from the Brooklyn Museum through the kindness of Chas. Schaeffer.

*Distribution.*—Pennsylvania, New York, Massachusetts, New Hampshire, and Maine.

*Food plant.*—Unknown.

## ZALE OBLIQUA (Gn.)

## ZALE SQUAMULARIS (Drury)

In placing both *obliqua* and *squamularis* at the head of this description, the writer is not expressing an opinion as to whether the two "species" are distinct or not. One larva labeled as *squamularis* and two larvae as *obliqua* have been examined and no distinguishing characters have been found, but there is no way of ascertaining whether the specimens are correctly determined.

Head 3.7 mm. broad. Body about 45 mm. long and 5 mm. broad at middle. Middorsal pale stripe conspicuously expanded just posterior to a line which would connect setigerous tubercles II on abdominal segments 3, 4, 5, and 6. Intersegmental pale area absent. Setigerous tubercle II on abdominal segment 8 conspicuous but attached to the dorsum for most of its length, the dorsal length (anterior margin to seta) equal to or somewhat greater than height of spiracle on this segment (32:28).

Head reticulation mostly red, dark about setae P<sup>1</sup> and P<sup>2</sup>; labrum scarcely lobed anteriorly, with a very broad, shallow median emargination; basal width of front approximately equal to the height (35:36); height of front much less than length of median line (35:60).

Described from one inflated larva of *squamularis* labeled "Lakehurst, N. J., June 10" from Chas. Rummel, and two inflated larvae of *obliqua* in the U. S. National Museum, one of which is labeled "On pine, June 1880, Tallahassee, Fla., A. Koebele" and the other "On *Pinus taeda*, May 9, 1884."

*Distribution of obliqua*.—Florida, Georgia, North Carolina, Tennessee, Maryland, Pennsylvania, and New York; *squamularis*: North Carolina, Maryland, New Jersey, Pennsylvania, and New York.

*Food plant*.—Pine.

## ZALE METATA (Sn.)

Head 3.2 mm. broad. Body about 40 mm. long and 4 mm. broad at middle. Middorsal pale stripe abruptly broadened just posterior to a transverse line which would connect setigerous tubercles II on abdominal segments 4, 5, and 6. Intersegmental area between 1 and 2 visible but covered by reticulation. Setigerous tubercle II on abdominal segment 8 large, projecting free from the dorsum; the dorsal length (anterior margin to seta) much greater than height of spiracle on this segment (53:31).

Head reticulation dark; labrum scarcely lobed anteriorly, very broadly, shallowly emarginate anteriorly; width of front approximately equal to the height (32:33); height of front much less than length of median line (33:55).

Described from one alcoholic larva reared to maturity at Arlington, Va., May-June 1949, by J. G. Franclemont. Reared moths determined by Franclemont.

*Distribution*.—Florida, North Carolina, Virginia, Maryland, Pennsylvania, and New York.

*Food plant*.—Virginia pine (*Pinus virginiana*) (Franclemont).

## ZALE RUBI (Hy. Edw.)

Head width not recorded. Body about 35 mm. long and 4 mm. broad at middle. Middorsal pale stripe filled with brown except at the margins, appearing as a geminate white line; not abruptly broadened posterior to the line of setigerous tubercles II on abdominal segments 4, 5, and 6. Setigerous tubercle II on abdominal segment 8 very small and attached to the dorsum for the entire length; dorsal length less than height of spiracle on this segment (20:28).

Head reticulation dark; labrum strongly lobed anteriorly with a broadly V-shaped median emargination; width of front approximately equal to the height (26:28); height of front much less than length of median line (28:45).

Described from four larvae collected on the grounds of the Southwestern Arboretum near Superior, Ariz., during the earlier part of May 1938. A moth emerged June 18, 1938, and another July 2, 1938. These moths were determined by Clarke.

*Distribution.*—California, Nevada, and Arizona.

*Food plant.*—Willow.

#### ZALE CINGULIFERA Wlk.

Head 3 mm. broad. Body about 48 mm. long and 5.5 mm. broad at middle. Middorsal pale stripe approximately parallel-sided on abdominal segments 3, 4, 5, and 6. Intersegmental area visible but covered by reticulation. Setigerous tubercle II on abdominal segment 8 nearly flat on the dorsum, the dorsal length somewhat less than height of spiracle on this segment (30:35).

Head reticulation mostly dark red. Labrum strongly lobed anteriorly, with a V-shaped median emargination; width of front somewhat less than the height (29:33); height of front distinctly less than length of median line (33:45).

Described from two alcoholic larvae reared to maturity at Arlington, Va., May 1949, by J. G. Franclemont, and one inflated specimen collected at Green Village, N. J., June 10, by Chas. Rummel.

*Distribution.*—Florida, Georgia, South Carolina, Virginia, New Jersey, Pennsylvania, New York, Massachusetts, New Hampshire, and Wisconsin.

*Food plant.*—Wild cherry (*Prunus serotina*) (teste Franclemont).

#### ZALE UNILINEATA (Grt.)

Head 3 to 3.2 mm. broad. Body about 37 mm. long and 4.5 mm. broad at middle. Middorsal pale stripe approximately parallel-margined on abdominal segments 4, 5, and 6. Intersegmental area distinct but not conspicuous. Setigerous tubercle II on abdominal segment 8 nearly flat on the dorsum, the dorsal length (anterior margin to seta) equal to or slightly less than height of spiracle on this segment (32:36).

Head reticulation dark; labrum strongly lobed anteriorly with a rather narrow median emargination; width of front equal to or but slightly less than height of front (28:33); height of front distinctly less than length of median line (33:45).

Described from six alcoholic larvae reared to maturity at Arlington, Va., in May 1949, by J. G. Franclemont.

*Distribution.*—Virginia, Maryland, New Jersey, New York, Pennsylvania, New Hampshire, and Iowa.

*Food plant.*—Black locust (*Robinia pseudacacia*) (teste Franclemont).

#### ZALE UNBULARIS (Drury)

Head 3.1 mm. broad. Body about 40 mm. long and 5 mm. broad at middle. Middorsal pale stripe nearly parallel-margined throughout on abdominal segments 4, 5, and 6. Intersegmental area small, not entirely obliterating the dark stripe including setigerous tubercles I and II. Setigerous tubercle II on abdominal segment 8 attached to the dorsum for nearly the entire length and very slightly elevated posteriorly; the dorsal length approximately equal to height of spiracle on this segment (30:31).

Head reticulation mostly dark, labrum strongly lobed anteriorly, with a narrow V-shaped median emargination; width of front slightly less than the height (28:30) height of front distinctly less than length of median line (30:44).

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USDA TECHNICAL BULLETINS

UPDATA

THE LARVAE OF THE PHALLENIDAE

CRUMB, S. E.

4 OF 4

Described from two alcoholic larvae collected at Lea Centre, Ill., July 10, 1935, by A. K. Wyatt.

*Distribution*.—Florida, Georgia, North Carolina, Virginia, Maryland, New Jersey, Pennsylvania, Ohio, Illinois, Minnesota, New York, Connecticut, and Massachusetts.

*Food plant*.—Black locust (*Robinia pseudoacacia*) (teste Wyatt).

#### ZALE GALBANATA (MORT.)

Head 3 mm. broad. Body about 40 mm. long and 5 mm. broad at middle. Middorsal pale stripe almost parallel-margined on abdominal segments 4, 5, and 6. Intersegmental pale area absent or very faint. Setigerous tubercle II on abdominal segment 8 attached to the dorsum for nearly the entire length but considerably elevated posteriorly.

Head reticulation dark; labrum strongly lobed anteriorly with a broadly V-shaped median emargination; width of front nearly equal to the height (30:32); height of front much less than length of median line (32:50).

Described from two inflated larvae in the U. S. National Museum, probably from the Barnes collection, labeled "Maple, Decatur."

*Distribution*.—Kansas, Nebraska, Iowa, Illinois, South Dakota, and Minnesota.

*Food plant*.—Maple.

#### ZALE LUNATA (DRURY)

Head 3.5 to 3.7 mm. broad. Body about 35 mm. long and 5.5 mm. broad at middle. Middorsal pale stripe abruptly broadened just posterior to a transverse line which would connect setigerous tubercles II on abdominal segments 3, 4, 5, and 6. Intersegmental area large, conspicuous. Setigerous tubercle II on abdominal segment 8 large, conical, projecting free from the dorsum; dorsal length (anterior margin to seta) much greater than height of spiracle on this segment (56:39).

Head reticulation mostly dark; labrum strongly lobed anteriorly with a broadly V-shaped median emargination; width of front decidedly less than the height (30:40); front height decidedly less than length of median line (40:57).

Described from numerous larvae from various sources collected in May, June, August, September, and October. Reared moths emerged in July, November, and December, and were determined by Benjamin.

*Distribution*.—Records include virtually all of the States east of the Rocky Mountains, except South Dakota, North Dakota, and Montana. West of the Rocky Mountains *lunata* is found in California, Oregon, and Washington.

*Food plants*.—Blackberry, raspberry, salmonberry, rose, willow, oak, and wisteria.

#### ZALE HORRIDA Hbn.

Head 3 mm. broad. Body about 40 mm. long and 4.5 mm. broad at middle. Middorsal pale stripe abruptly broadened just posterior to a transverse line which would connect setigerous tubercles II on abdominal segments 3, 4, 5, and 6. Setigerous tubercle II on abdominal segment 8 rather large, conical projecting free from the dorsum, the dorsal length considerably greater than height of spiracle on this segment (46:35).

Head reticulation mostly dark; labrum strongly lobed anteriorly with a broadly V-shaped median emargination; width of front but slightly less than the height (30:33); front height decidedly less than length of median line (33:48).

Described from one larva collected near Chicago, Ill., July 11, 1941, by A. K. Wyatt.

*Distribution*.—Texas, Florida, North Carolina, Tennessee, Maryland, West Virginia, Illinois, Wisconsin, Pennsylvania, New Jersey, New York, Massachusetts, New Hampshire, and Maine.

*Food plant*.—*Viburnum lentago* (teste Wyatt).

#### ZALE MINEREA (Gn.)

Head 3.4 to 4 mm. broad. Body about 40 mm. long and 5.5 mm. broad at middle. Middorsal pale stripe abruptly broadened just posterior to a transverse line which would connect setigerous tubercle II on abdominal segments 3, 4, 5, and 6. Intersegmental area on 1 large, conspicuous. Setigerous tubercle II on abdominal segment 8 large, conical, projecting free from the dorsum; the dorsal length (anterior margin to seta) much greater than height of spiracle on this segment (70:38).

Head reticulation mostly dark; labrum strongly lobed anteriorly with a broadly V-shaped median emargination; width of front but slightly less than the height (32:35); front height decidedly less than length of median line (35:66).

Described from eight larvae: 2 larvae collected July 18, 1937, at Currant Flat on Highway 410 on the eastern slope of the Cascade Mountains in Washington; 4 alcoholic specimens collected at Chicago, Ill., by A. K. Wyatt; and 2 inflated larvae in the U. S. National Museum labeled "No. 1251 A, Kaslo Cr., B. C., H. G. Dyar coll." From larvae collected July 18, 1937, a moth emerged March 24, 1938, and was determined by Clarke.

*Distribution*.—United States: North Carolina, Maryland, New Jersey, Pennsylvania, New York, New Hampshire, Maine, Illinois, Iowa, Colorado, Montana, California, and Washington. Canada: Ontario, Manitoba, and British Columbia.

*Food plants*.—Rose and willow.

#### TOXOCAMPA Gn.

##### TOXOCAMPA VICTORIA Grt.

Head 2.4 to 2.6 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color pale gray, the dorsum tinged with brownish and more infuscated on posterior abdominal segments.

A narrow, brownish middorsal stripe, broadening gradually to the middle of each abdominal segment and margined by pale lines. Other markings tending to be obscure and irregular but a small dark spot between setigerous tubercles I and III on abdominal segment 7 and a pale band between III and V are distinctive. Spiracles golden brown. Venter pale with a median dark line. Setigerous tubercles black, small, and nearly or quite flat. Head white with slender, straight, black submedian stripes and sparse dark reticulation.

Described from 10 larvae collected both east and west of the Cascade Mountains in Washington late in May by W. W. Baker, Joseph Wilcox, and the writer. Moths emerged June 26, 1932, and June 30, 1938, and were determined by Benjamin and by Clarke, respectively.

*Distribution*.—United States: New Mexico, Arizona, Colorado, Utah, California, Oregon, Washington, and Montana. Canada: British Columbia.

*Food plant*.—Species of snowberry (*Symphoricarpos*).

## CATOCALA Schrank

1. With a middorsal hump, horn, or transverse ridge on abdominal segment 5. A fringe of fleshy filaments present laterally on the venter. Mandible with a free basal process bearing an apical molar area (pl. 11, C). Head often distinctly protuberant between setae P<sup>1</sup> and P<sup>2</sup>----- 20  
Without both a middorsal prominence on abdominal segment 5 and a fringe of fleshy filaments laterally on the venter except in a few species in which the basal process on mandible either is absent (pl. 11, B) (*palaeogama*) or pointed apically and without a visible molar area (pl. 11, A) (*maestosa*, *agrippina*). Head not protuberant between setae P<sup>1</sup> and P<sup>2</sup> except in *agrippina*----- 2
2. Oral face of mandible with a free basal process, surrounded, except basally, by a concave area (pl. 11, C). Notch in anterior margin of labrum broad and not extending half way to base (pl. 11, H)----- 3  
Oral face of mandible without a basal process but with a narrow, transverse molar area on the face of the mandible in a groove which is directed basally near dorsal margin only (pl. 11, B). Notch in anterior margin of labrum often narrow and extending half way to the base (pl. 11, G). Feed on walnut and hickory----- 14
3. Basal process on oral face of mandible subcylindrical, the apex bearing a distinct molar area (pl. 11, C). Feed on leguminous trees or shrubs----- 4  
Basal process on oral face of mandible flattened on outer face and bluntly pointed apically, with the molar area concealed or absent (pl. 11, A)----- 7
4. With a middorsal hump on abdominal segment 5. Basal process on mandible bearing coarse, strongly elevated granules on molar area (pl. 11, D). Subventral pale stripe obscure----- *innubens*  
Without a middorsal hump on abdominal segment 5. Subventral pale stripe very conspicuous----- 5
5. Coloration made up of transverse black lines, interrupted by orange spots. Basal process on oral face of mandible large, bearing strongly elevated granules on the molar area (pl. 11, D)----- *illecta*  
Basal process on oral face of mandible slender, molar area without granules----- 6
6. Dark dorsal markings consisting of strong, black longitudinal lines. Molar area on basal process of mandible simple (pl. 11, F)----- *amestris*  
Dark dorsal markings consisting of well separated, rather evenly distributed dots except at the spiracles. Molar area on basal process of mandible with an elevated, irregularly produced rim, like a ruffle (pl. 11, E)----- *nuptialis*
7. Hind coxae almost touching about one-seventh the femur width apart. Oral face of mandible with two distal molar areas. Feed on species of *Myrica*. 8  
Hind coxae at least nearly one-half the femur width apart. Mandible with three distal molar areas (pl. 11, A). Feed on hickory and walnut----- 10
8. Black U-mark margining face present but usually obsolete dorsally and sometimes barely indicated laterally. Middorsal pale stripe absent or very obscure. Cervical shield without a white subdorsal line----- *badia*  
Black U-mark absent on the face. Middorsal pale stripe distinct. White subdorsal line present on cervical shield----- 9
9. Width of spiracle on abdominal segment 8 equal to approximately one-half the height (10:19). Shields on outer face of prolegs dark purplish. Head markings orange----- *multorcula*  
Width of spiracle on abdominal segment 8 equal to somewhat more than one-half the height (10:16). Shields on outer face of prolegs dark orange or reddish. Head markings reddish or brown----- *antinympa*
10. With a low, transverse ridge middorsally on abdominal segment 5. Spiracles brown. Lateral fringe normally present, often reduced to but a few filaments and occasionally entirely absent----- 13  
Without a middorsal prominence on abdominal segment 5----- 11
11. Dorsal length of setigerous tubercle II on abdominal segment 8 equal to approximately one-half the height of the spiracle on this segment (13:25). Spiracles brown. Head often with a black U-mark margining the face laterally and dorsally and remarkably broadened dorsally----- *piatrix*  
Dorsal length of setigerous tubercle II on abdominal segment 8 at least approaching the height of the spiracle on this segment (24:28). Spiracles black. Head without a black U-mark margining the face----- 12

12. Lateral fringe well developed. Middorsal pale stripe forming a series of distinct pale spots on abdominal segments. Setigerous tubercles I and II black about the base with pale apex..... *neogama*  
 Lateral fringe absent or nearly absent (one fringe filament found in four larvae examined). Middorsal pale stripe obscure, not forming a series of pale spots on abdominal segments. Setigerous tubercles I and II clear orange or yellow..... "*neogama*"
13. Setigerous tubercle I nearly or quite flat and appressed to the skin on anterior abdominal segments. Head not protuberant between setae P<sup>1</sup> and P<sup>2</sup>. Middorsal pale stripe forming a series of pale spots on abdominal segments..... *macstosa*  
 Setigerous tubercle I very large and strongly elevated, subconical throughout. Head protuberant between setae P<sup>1</sup> and P<sup>2</sup>. Middorsal pale stripe obscure, not forming a series of pale spots on abdominal segments..... *agrippina*
14. Lateral fringe present..... 18  
 Lateral fringe absent..... 15
15. Setigerous tubercles I and II very small, I minute and flat on the skin throughout. Face bordered laterally and dorsally by a black U-mark. 16  
 Setigerous tubercles I and II moderately large, I at least somewhat elevated on anterior abdominal segments. No black U-mark on head..... 17
16. Setigerous tubercle II with a small, slightly elevated, sclerotized area on anterior abdominal segments, the dorsal length of II on abdominal segment 8 equal to but one-fourth the height of the spiracle on this segment (5:20). Markings on anal shield mostly dark..... *habilis*  
 Setigerous tubercle II minute, a mere setal insertion without a surrounding sclerotized area on anterior abdominal segments, the dorsal length of II on abdominal segment 8 approaching one-half the height of the spiracle on this segment (11:26). Markings on anal shield mostly red..... *robinsoni*
17. The black area on head above the antennal insertion produced dorsally as a short black stripe terminating but slightly beyond the ocelli. Head striped and reticulate with reddish..... *judith*  
 The black area on head above the antennal insertion produced dorsally as a black stripe extending half way up the cheek, terminating dorsally at or near seta L<sup>1</sup>. Head marked with slender, dark longitudinal lines..... *residua*
18. With a low, transverse ridge middorsally on abdominal segment 5. Dorsal length of setigerous tubercle II on abdominal segment 8 much greater than the height of the spiracle on this segment (37:26). Spiracles black *palaecogama*  
 Without a middorsal prominence on abdominal segment 5. Dorsal length of setigerous tubercle II on abdominal segment 8 equal to approximately one-half the height of the spiracle on this segment (17:29). Spiracles apparently white..... 19
19. The narrow black margin of head above the antennal insertion produced dorsally as a black stripe extending half way up the cheek to seta L<sup>1</sup>..... *retracta*  
 The narrow black margin above the antennal insertion produced as a short black stripe terminating dorsally opposite the ocelli..... *vidua*
20. Head coarsely granulose, the granules sometimes obscure. Dorsal prominence on abdominal segment 5 not in the form of a horn..... 21  
 Head quite smooth except with faint coarse granules in *verrilliana* in which the dorsal prominence on abdominal segment 5 is in the form of a horn. Seta V on mesothorax and metathorax setiform, sometimes very short... 37
21. Seta V on mesothorax and metathorax absent (pl. 7, X). Setae VII<sup>a</sup> and VII<sup>c</sup> on abdominal segment 1 absent or represented by a short, fleshy cone. Food plant oak..... 22  
 Seta V on mesothorax and metathorax present or represented by a short, fleshy cone (pl. 7, Y, Z). Setae VII<sup>a</sup> and VII<sup>c</sup> on abdominal segments 1 and 2 present and setiform but sometimes small. Food plants linden (*cerogama*) or willow and poplar..... 24
22. Setae VII<sup>a</sup> and VII<sup>c</sup> absent on abdominal segment 1 but present and setiform on 2. Setigerous tubercle I flat on anterior abdominal segments. Spiracles white..... *herodias*

- Setae VII<sup>a</sup> and VII<sup>b</sup> reduced to a short, fleshy cone on both abdominal segments 1 and 2. Setigerous tubercle I distinctly elevated on anterior abdominal segments. Spiracles black or brown.----- 23
23. Dorsal length of setigerous tubercle II on abdominal segment 8 equal to decidedly more than the spiracle height on this segment (34:24). Inverted black U-mark on head usually absent except a strong, curved bar across the occiput. Setigerous tubercles black with white about the base  
*aholibah*
- Dorsal length of setigerous tubercle II on abdominal segment 8 equal to approximately the height of the spiracle on this segment (28:28). Inverted black U-mark on head strong and fully developed, margining the face both dorsally and laterally. Setigerous tubercles I and II brown.----- *ilia*
24. Seta V on mesothorax and metathorax present and setiform, the seta sometimes short but the length equal to at least several times the basal width. (pl. 7, F)----- 29
- Seta V on mesothorax and metathorax reduced to a short, blunt, fleshy cone, at most scarcely longer than broad (pl. 7, Z)----- 25
25. Head, at most, but very slightly protuberant between setae P<sup>1</sup> and P<sup>2</sup>. Molar area on basal process of mandible bearing conspicuous, coarse granules. Spiracles black.----- 26
- Head very distinctly protuberant between setae P<sup>1</sup> and P<sup>2</sup>. Spiracles dark brown.----- 27
26. Dorsal length of setigerous tubercle II on abdominal segment 8 equal to approximately one and one-half times the height of the spiracle on this segment (30:19). A few black flecks on head dorsally and laterally but no black reticulation. Feeds on linden.----- *cerogama*
- Dorsal length of setigerous tubercle II on abdominal segment 8 equal to approximately one-third the height of the spiracle on this segment (11:30). Head heavily reticulate with black both anteriorly and posteriorly. Feeds on willow and poplar.----- *relicta*
27. Setigerous tubercle I on the abdomen flat on the skin throughout. Middorsal pale stripe forming a series of pale spots on the abdomen.----- *amatrix*
- Setigerous tubercle I somewhat elevated throughout. Middorsal pale stripe obscure, not forming a series of pale spots on the abdomen.----- 28
28. Filaments in the lateral fringe very short, the average length equal to one-half the height of the spiracle on abdominal segment 8 or less (8:24). Venter pink. Face nearly flat.----- *concupens*
- Filaments of lateral fringe with an average length equal to the height of the spiracle on abdominal segment 8 (30:27). Venter red. Dishfaced owing to the extraordinarily strong, conical, protuberance between setae P<sup>1</sup> and P<sup>2</sup> and an elevation across base of front.----- *cara*
29. Head, in profile, at most, but very slightly protuberant between setae P<sup>1</sup> and P<sup>2</sup>. The black U-mark margining the face very broad, the width opposite seta L<sup>1</sup> equal to twice the width of ocellus III or more. Distribution restricted to areas east of the Rocky Mountains except that *unijuga* is found also in Utah.----- 30
- Head in profile, distinctly protuberant between setae P<sup>1</sup> and P<sup>2</sup>. Width of black U-mark opposite seta L<sup>1</sup> equal, at most, to but slightly more than the width of ocellus II except in *nevadensis*. Distribution restricted to areas west of the Rocky Mountains except in *luciana*.----- 31
30. Skin smooth. Setigerous tubercle I small but distinctly elevated, subconical, on anterior abdominal segments. Head reticulate with black posterior to the ocelli.----- *unijuga*
- Skin coarsely granulose (a unique character in Catocala). Setigerous tubercle I flat on the skin on anterior abdominal segments. Head not reticulate with black posterior to the ocelli.----- *parta*
31. Mandible with but one distal molar area (No. 4) or with none.----- 32
- Mandible normally with three distal molar areas but these sometimes obscure and occasionally absent. Average length of lateral filaments equal, at most, to but slightly more than one-half the spiracle height on abdominal segment 2. Head not reticulate with black posterior to the ocelli except occasionally in *babayaga*.----- 34
32. Average length of lateral filaments equal to one-half height of spiracle on abdominal segment 2, or less. Spiracles brown. Venter pink. Distribution limited to prairie areas from Kansas and Illinois northward to Montana, Manitoba, and Minnesota.----- *luciana*

- Average length of lateral filaments nearly equal to height of spiracle on abdominal segment 2, or more. Distribution limited to areas west of the Rocky Mountains----- 33
33. Black U-mark on head broad, the width opposite seta L' equal to twice the diameter of ocellus III, or more. Head reticulate with black posterior to the ocelli. Spiracles brown. General color pale gray sparsely but distinctly marked with black.----- *nevadensis*
- Black U-mark on head approximately equal in width to the diameter of ocellus III opposite seta L'. Head not reticulate with black posterior to the ocelli. Spiracles whitish. General color uniform pale greenish gray.----- *allusa*
34. Setigerous tubercle II brown or gray. Venter dull purplish with the usual segmental dark spots. General color usually brownish. Spiracles brown.----- 35
- Setigerous tubercle II orange. Venter pink with the usual segmental dark spots. General color pale gray. Spiracles probably whitish----- 36
35. Head of mature larva 3 to 3.3 mm. broad. Setigerous tubercle II pale gray. Found in Washington, Arizona, Utah, and California.----- *trenc*
- Head of mature larva 3.7 mm. broad. Setigerous tubercle II pale brown. Found in Arizona only.----- *babayaga*
36. Head of mature larva 3.4 to 3.6 mm. broad. Head and body not marked with red. Dark U-mark margining the face extremely slender, the width opposite seta L' scarcely more than one-half the diameter of ocellus III; tending to be obsolete posterior to seta L' and sometimes brownish rather than black.----- *arizonae*
- Head of mature larva 4 mm. broad. Head and body marked with red. Black U-mark margining the face with width opposite seta L' equal to the diameter of ocellus III.----- *hermia*
37. Skin bearing minute granules, obscure in *crataegi* in which setigerous tubercle II is flat on the skin on anterior abdominal segments. All except *ultronia* feed on thorn (*Crataegus*) or apple.----- 42
- Skin without granules. Setigerous tubercle II at least somewhat elevated throughout on abdominal segments. Spiracles brown.----- 38
38. Middorsal prominence on abdominal segment 5 in the form of a heavy, sub-cylindrical, bluntly pointed horn, inclined posteriorly and with a much smaller horn closely posterior to it on the same segment.----- *vervilliana*
- Middorsal prominence on abdominal segment 5 a transverse, low, rounded hump, usually with a short subconical projection medially and without a secondary horn or other prominence.----- 39
39. Feed on oak.----- 40
- Feed on huckleberry or honeylocust (*Gleditsia*).----- 41
40. Head scarcely protuberant between setae P<sup>1</sup> and P<sup>2</sup>, face reticulate with dusky reddish; sides and top of head reticulate with red. Occurs in most of the eastern half of the United States.----- *micronympha*
- Head usually distinctly protuberant between setae P<sup>1</sup> and P<sup>2</sup>, the face with longitudinal black lines, sides and top of head not reticulate with red. Reported from Arizona only.----- *ochlidonia*
41. Sides and top of head strongly reticulate with black, the black U-mark absent or fused with the black reticulation. Feeds on honey locust (*Gleditsia*).----- *minuta*
- Sides and top of head reticulate with reddish, darker posterior to the ocelli, the black U-mark present. Feeds on huckleberry (*Vaccinium*)-- *gracilis*
42. Middorsal prominence on abdominal segment 5 in the form of a pointed horn, inclined posteriorly. Spiracles white.----- 43
- Prominence middorsally on abdominal segment 5 a heavy, bluntly subconical or flattened projection drooping posteriorly. Spiracles brown.----- 45
43. Horn cylindrical with a bluntly pointed apex. Venter red.----- *ultronia*
- Horn conical, tapering gradually to an acute apex. Venter white or greenish white, sometimes tinged slightly with pink.----- 44
44. Face with black or blackish reticulation suffused with pinkish, the pinkish tint sometimes predominating, with the interstices white or pinkish. Protuberance between setae P<sup>1</sup> and P<sup>2</sup> orange. Middorsal pale stripe distinct both on thorax and abdomen, often margined by distinct black lines.----- *grynea*

Face reticulate with black or blackish not suffused with pinkish, the interstices brown. Protuberance between setae P<sup>1</sup> and P<sup>2</sup> red. Middorsal pale stripe scarcely traceable and not margined by black lines in the one specimen examined.

45. Setigerous tubercle II conspicuously large, the dorsal length on abdominal segment 8 distinctly greater than height of spiracle on this segment (42:34) *mira*  
*blandula*  
 Setigerous tubercle II small, the dorsal length on abdominal segment 8 equal to distinctly less than the height of the spiracle on this segment (22:30), (17:28) 46
46. Setigerous tubercle II flat on the skin on anterior abdominal segments. *crataegi*  
 Setigerous tubercle II distinctly elevated throughout on abdominal segments. *praeclara*

The data on distribution given for the following species of *Catocala* are abridged from the memoir by Barnes and McDunnough (?).

#### CATOCALA INNUBENS Guen.

Head 3.2 mm. broad. Body about 55 mm. long and 7 mm. broad at middle, tapering posteriorly; skin smooth; general color brown.

Dorsum to III marked with black dots, the longitudinal stripes approximately parallel-margined and not sharply defined except in an area across the dorsum posteriorly on 5 and anteriorly on 6 in which the color of the dark and pinkish stripes is intensified. A well-defined black stripe including the spiracles, bordered ventrally by a pinkish stripe and this bordered by a well-defined black stripe along the base of the prolegs. Venter yellow with the usual dark spots. Spiracles black or dark gray. Lateral fringe absent. A slightly elevated black hump middorsally on 5. Setigerous tubercles I and II black, of moderate size, I flat on the skin on anterior abdominal segments, dorsal length of II on 8 equal to approximately one-half the height of the spiracle on this segment (10:18). Head smooth, not protuberant between P<sup>1</sup> and P<sup>2</sup>, pale, with purplish longitudinal stripes which break into reticulation posteriorly.

Described from six inflated larvae in the U. S. National Museum collection, "Honeylocust, Dodge, Louisiana, Mo."

*Distribution.*—New York and North Carolina westward through much of the eastern half of the United States; common in the Ohio and Mississippi Valleys. Also occurs in Ontario, Canada.

*Food plant.*—Honeylocust (*Gleditsia triacanthos*).

#### CATOCALA ILLECTA Wik.

Head 3.2 mm. broad. Body about 50 mm. long and 6 mm. broad at middle, tapering posteriorly; skin pavement granulose; general color black with slender, pale transverse lines.

Dorsum to and including the spiracles black with about 10 transverse pale lines on each abdominal segment. Orange spots about I and II and above the spiracles. A transverse orange stripe dorsally on each thoracic segment. Spiracles black. A conspicuous pale longitudinal stripe partially including the spiracles and reaching but not including V on median abdominal segments and not including VI on any segment. A black line along bases of prolegs. Venter black, the transverse pale lines less regular than on the dorsum. Lateral fringe absent. Middorsal prominence on 5 absent. Setigerous tubercles minute except II on 8 and 9 which is very small and nearly flat, the length on 8 equal to about one-seventh the spiracle height on this segment (3:21). Head smooth, not protuberant between P<sup>1</sup> and P<sup>2</sup>, pale reticulate with red, with two slender black longitudinal stripes on each side on face, a black stripe below the ocelli, a few black spots posteriorly and a black median line on front.

Described from four inflated larvae in the U. S. National Museum, "illecta, Dodge," and two alcoholic larvae from A. E. Brower, "Lincoln Co., Ark., April-May 1938."

*Distribution.*—United States: Through Central Plains States to Texas. Canada: Ontario.

*Food plant.*—Leadplant (*Amorpha canescens*).

#### CATOCALA AMESTRIS Stkr.

Head 3.4 mm. broad. Body about 50 mm. long and 6 mm. broad at middle, tapering posteriorly; skin smooth; general color pale yellow or white with slender, black longitudinal lines.

Dorsum to and including the spiracles with a slender dark line middorsally and six strong black longitudinal lines on each side, that including the spiracles broadest and most intensely black. Spiracles black. Subventral stripe yellow or white, extremely broad, the ventral margin including VI, with a broken black line in the line of V. Venter black with pale markings. Lateral fringe absent. Middorsal prominence on 5 absent. Setigerous tubercles I and II yellow, small but somewhat elevated on all abdominal segments, the dorsal length of II on 8 equal to approximately one-half the height of the spiracle on this segment (10:17). Head pale yellowish, smooth, not protuberant between P<sup>1</sup> and P<sup>2</sup> with four broken black longitudinal lines on each side on the face, a few black spots posteriorly, a black mark below the ocelli and a black median line on front.

Described from five larvae labeled variously: "On *Amorpha fruticosa*, Boll.," U. S. National Museum; "Montague Co., Tex. on *Amorpha fruticosa*," from A. E. Brower; and "Elizabeth, Ill., V.30.42, on leadplant (*Amorpha fruticosa*)," from A. K. Wyatt.

*Distribution.*—Texas, Kansas, Nebraska, Wisconsin, Illinois, and North Carolina.

*Food plant.*—Leadplant (*Amorpha canescens*).

#### CATOCALA NUPTIALS Wlk.

Head 2.8 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, tapering posteriorly; skin smooth; general color probably yellowish.

Dorsum to but not including III with rather uniformly distributed rounded black dots not arranged in lines. Including III and partially including the spiracles a black stripe composed of 3 black lines. Spiracles black. A prominent yellowish subventral stripe, less distinct posteriorly and not including V on median abdominal segments or VI on any segment. A stripe of dilute dorsal color along base of prolegs bordered ventrally by a pale stripe with VI at the dorsal margin, more evident on anterior abdominal segments and bordered ventrally by a row of black dots. Midventer yellowish dotted with black and with the usual segmental dark spots. Lateral fringe absent. Middorsal prominence on 5 absent. Setigerous tubercles I to VI yellowish or pale orange, large and broadly convex, the dorsal length of II on 8 equal to somewhat more than half the height of the spiracle (11:17). Head pale, smooth, not protuberant between P<sup>1</sup> and P<sup>2</sup>, with obscure rows of black flecks on dorsal half.

Dr. A. E. Brower has reared moths of this species and furnished the following alcoholic larvae from which the description was made: 1 larva, "Dresbach, Minn., VII.5, 1938"; 2 larvae, "Putnam Co., Ill., VI.11.38. *Amorpha fruticosa*"; 2 larvae, "Lynxville, Wis., 1939, *Amorpha fruticosa*."

*Distribution.*—Manitoba through the Mississippi Valley to Texas.

*Food plant.*—Leadplant (*Amorpha canescens*).

#### CATOCALA BADIA G. & R.

Head 3 to 3.3 mm. broad. Body about 45 mm. long and 6 mm. broad at middle, tapering posteriorly; skin smooth; general color brown or brownish, apparently sometimes varying to blackish.

Dorsum to base of prolegs marked with black flecks which tend to form longitudinal lines. Coloration darker dorsally to setigerous tubercle II and from III

to base of prolegs. The middorsal pale stripe, at most scarcely traceable and the paler stripe between II and III typically obscure or absent but sometimes rather distinct. No transverse dark line posterior to II on 8. Spiracles black or brown. Venter white with a broken black line laterally, the usual segmental dark spots tending to form a dark midventral line. Lateral fringe absent. Middorsal prominence on 5 absent. Setigerous tubercles I and II white, moderately large, of about equal size on anterior abdominal segments, broadly conical and distinctly elevated throughout; the dorsal length of II on 8 equal to decidedly less than the height of the spiracle on this segment (13:20). Head smooth, pale, with a black U-mark margining the face laterally and dorsally when fully developed but usually obsolete dorsally and sometimes barely traceable laterally; not protuberant between P<sup>1</sup> and P<sup>2</sup>; with brown or orange stripes anteriorly, broken into reticulation posteriorly.

Described from 2 inflated larvae in the U. S. National Museum, Barnes collection; 2 inflated larvae in U. S. National Museum from Brooklyn Museum; and 3 alcoholic larvae, "Long Island, N. Y., Field collected," from A. E. Brower.

*Distribution.*—Southern New England States and Northern Atlantic States.

*Food plants.*—Waxmyrtle (*Myrica cerifera*) and sweetfern (*Myrica asplenifolia*).

#### CATOCALA MULIERCULA Gn.

Head 2.7 to 3.0 mm. broad. Body about 55 mm. long and 6.5 mm. broad at middle, tapering posteriorly; skin smooth; dorsal ground color varying from brown to orange overlaid with black flecks throughout to base of prolegs, the flecks tending to form lines particularly anteriorly.

A distinct middorsal brown or orange stripe, a dark stripe including setigerous tubercles I and II, a brown or orange longitudinal stripe between II and III; including III and extending to base of prolegs black, with traces of a subventral stripe of the ground color. Venter yellowish with a dark line laterally on each side and the usual segmental midventral dark spots. Sclerotized shields on outer face of prolegs dull purple. Spiracles brown. Lateral fringe absent. Middorsal prominence on 5 absent. Setigerous tubercles I and II white, small but with I somewhat elevated throughout, the dorsal length of II on 8 equal to approximately half the height of the spiracle on this segment (10:19). Head smooth, not protuberant between P<sup>1</sup> and P<sup>2</sup>, pale, with about 7 orange stripes on each side which tend to break into reticulation posteriorly and without a black U-mark margining the face laterally and above.

Described from 4 inflated larvae, 3 of which are from the Barnes collection, 1 from the U. S. National Museum.

*Distribution.*—New York to Florida along the Atlantic Coast.

*Food plant.*—Waxmyrtle (*Myrica cerifera*).

#### CATOCALA ANTINYMPHA (Hbn.)

Head 3.0 to 3.1 mm. broad. Body about 45 mm. long and 6 mm. broad at middle, tapering posteriorly, skin smooth, general color brown or orange.

Dorsal coloration made up of black flecks on a brown or orange ground, the flecks tending to form longitudinal black lines particularly on the thorax. A broad distinct, nearly parallel-margined brownish or orange stripe middorsally, flecked with black; a distinct black stripe including I and II; a distinct broad brownish or orange longitudinal stripe from ventrad of II to dorsad of III, and a black stripe including III and extending to base of prolegs. No black line posterior to II on 8. Venter yellow with a broken dark line laterally and with the usual segmental dark spots. Spiracles brown. Lateral fringe absent. Middorsal prominence on 5 absent. Setigerous tubercles I and II white, broadly conical and distinctly elevated throughout, of moderate size with II somewhat larger than I, the dorsal length of II on 8 considerably more than one-half the height of the spiracle on this segment (10:16). Head smooth, not protuberant between P<sup>1</sup> and P<sup>2</sup>; pale with about seven brown stripes on each side, showing a slight tendency to break into reticulation posteriorly, and without a black U-mark margining the face laterally and above.

Described from 4 inflated larvae in the U. S. National Museum, Barnes collection, and 1 alcoholic larva, "Bar Harbor, Me., 1933," from A. E. Brower.

*Distribution*.—Ontario and Quebec southward to Maryland and Pennsylvania.

*Food plant*.—Sweetfern (*Myrica asplenifolia*).

#### CATOCALA PIATRIX Gt.

Head 4.0 to 4.1 mm. broad. Body about 60 mm. long and 7 mm. broad at middle, tapering posteriorly; skin smooth; apparently occurs in two distinct color phases: one a soft infuscated brown, the other a pale greenish gray. All specimens seen by the writer, except one from the Barnes collection, have been of the brown phase.

*Brown phase* (5 larvae). Dorsum to and including base of prolegs closely dotted with black, the dots tending to be arranged in longitudinal lines. Usual dark and light longitudinal stripes obscure except dorsally on thorax and near juncture of segments dorsally on the abdomen, the longitudinal area including III and base of prolegs scarcely darker than remainder of body. No black line posterior to II on 8. Spiracles brown. Venter pink with the usual segmental dark spots. Lateral fringe absent. Middorsal prominence on 5 absent. Setigerous tubercles I and II white, small but distinctly elevated throughout, the dorsal length of II on 8 equal to approximately one-half the height of the spiracle on this segment (12:27). Head slightly roughened, not protuberant between P<sup>1</sup> and P<sup>2</sup>, whitish laterally striped with brown or gray, with a very distinctive black U-mark margining the face laterally and above, broad laterally, darker toward outer margin and remarkably broadened dorsally tending to cover the entire occiput and to extend upon the face as a blackish suffusion.

*Greenish gray phase* (1 larva). Dorsum to but not including III but faintly dotted with black; pale greenish gray with the usual light and dark longitudinal stripes subdued but distinct on thorax and anterior abdominal segments and traceable elsewhere, the margins formed by longitudinal dark lines, the middorsal pale stripe with a geminate dark median line. Including III and extending to base of prolegs abruptly heavily flecked with black with a black line in the line of the spiracles. No dark line posterior to II on 8. Venter pale with the usual dark segmental spots. Spiracles brown. Lateral fringe absent. Middorsal prominence on 5 absent. Setigerous tubercles I and II white, small but distinctly elevated throughout, the dorsal length of II on 8 equal to approximately one-half the height of the spiracle on this segment (13:25). Head smooth, not protuberant between P<sup>1</sup> and P<sup>2</sup>, heavily suffused with reddish throughout, with darker longitudinal stripes faintly visible and without a black U-mark margining the face laterally and dorsally but Barnes and McDunnough state that this may be either present or absent.

Described from four inflated larvae from the U. S. National Museum: "On walnut, July 25, 1882," "On walnut, Aug. 10, 1882," "On butternut, July 12, 1883," and "*piatrix*, walnut, Missouri, Barnes collection"; one inflated larva, "Green Village, N. J., VI.10," Chas. Rumel, collector; and one alcoholic larva, "Willard, Mo.," from A. E. Brower.

*Distribution*.—Eastern half of the United States westward to Texas, Arizona, and California; also occurs in Ontario, Canada.

*Food plants*.—Walnut and hickory.

#### CATOCALA NEOCAMA A. & S.

Head 3.8 to 4.1 mm. broad. Body about 60 mm. long and 7 mm. broad at middle, tapering posteriorly; skin smooth; general color gray.

Dorsal coloration to base of prolegs the same in detail as that described for *maestosa*. Spiracles black. Lateral fringe present. Middorsal prominence on 5 absent. Venter pink with the usual dark segmental spots. Setigerous tubercles I and II black with pale apex, small and but slightly elevated on anterior abdominal segments, the dorsal length of II on 8 equal to somewhat less than

the height of the spiracle on this segment (24:28). Head coarsely granulose, not protuberant between P<sup>1</sup> and P<sup>2</sup>, pale, with about 7 brownish or black longitudinal stripes on each side forming a dark mark between P<sup>1</sup> and P<sup>2</sup> and tending to break into reticulation posteriorly.

Described from two inflated larvae in the U. S. National Museum collection, "Dodge, Louisiana, Mo.;" one inflated larva in the U. S. National Museum collection, "Raleigh, N. C., On walnut, F. Sherman, Jr.," and two inflated larvae "Green Village, N. J., VI. 20," Chas. Rummel, collector.

*Distribution*.—Eastern half of the United States and northward into Ontario and Quebec.

*Food plants*.—Walnut and hickory.

#### CATOCALA NEOGAMA (?)

Head 4.4 to 4.8 mm. broad. Body about 60 mm. long and 9 mm. broad at middle, tapering posteriorly; skin smooth; general color gray.

Dorsum to and including base of prolegs marked rather uniformly with coarse black flecks which tend to be angular. Middorsal pale stripe barely traceable not tending to be obliterated anteriorly on abdominal segments and not forming a series of lanceolate pale spots. Other markings barely indicated. The dark stripe including I and II forming conspicuous black spots at II on 1 and 2 and somewhat defined on 5 and 6. A black line posterior to II on 8. Spiracles black. Venter apparently not pink but pale or white with the usual segmental dark spots. Lateral fringe absent or extremely sparse, but one fringe filament found in 4 specimens. Middorsal prominence on 5 absent. Setigerous tubercles pale orange or yellow, I and II large and well elevated throughout, the dorsal length of II on 8 equal to the height of the spiracle on this segment (30:30). Head coarsely granulose, not protuberant between P<sup>1</sup> and P<sup>2</sup>, pale, with about 7 brownish longitudinal lines on each side forming a darker mark between P<sup>1</sup> and P<sup>2</sup> and very slightly broken into reticulation posteriorly.

Described from four alcoholic larvae collected at Chicago, Ill., July 11, 1914, on walnut, by A. K. Wyatt. Dr. A. E. Brower is inclined to believe that the moths reared from these larvae are *neogama*.

*Distribution*.—Illinois.

*Food plant*.—Walnut.

#### CATOCALA MAESTOSA (Hbst.)

Head 4.1 to 4.6 mm. broad. Body about 65 mm. long and 10 mm. broad at middle, tapering posteriorly; skin smooth; general color dark gray or dark brownish.

Middorsal pale stripe constricted between I and II on most abdominal segments and more obscure anterior to this, forming a series of more or less distinct intersegmental, lanceolate pale spots. Dark stripe including I and II not parallel-margined except posterior to II and more obscure anteriorly on each abdominal segment, tending to be bordered outwardly by a black line particularly on first two abdominal segments. Pale longitudinal stripe ventrad of II and dorsad III with an obscure median dark stripe. The dark stripe including III and the spiracles tending to be obliterated in a spot postero-dorsad to the spiracles and to be margined by black lines. Venter pale with the usual segmental dark spots. Spiracles brown. Lateral fringe usually present but sometimes represented by but a few filaments and entirely absent in one specimen. Middorsal prominence on 5 a low transverse ridge, sometimes scarcely noticeable. Setigerous tubercles I and II brown or black with pale apices, I much smaller than II nearly or quite flat and appressed to the skin on anterior abdominal segments, the dorsal length of II on 8 equal to the height of the spiracle on this segment (33:30).

Head obscurely, coarsely granulose, not protuberant between P<sup>1</sup> and P<sup>2</sup>, pale, striped and reticulate with brown except that the markings are darker posterior to the ocelli.

Described from three alcoholic specimens from A. E. Brower, "*C. viduata*, Houston, Texas, May 1936, O. Mueller, Reared larvae gave *viduata*," and 4 inflated and 1 alcoholic larvae from the U. S. National Museum labeled "On pecan trunk" "8730, on pecan, Sparta, Ga.," "Walnut, July 8, 1882, *C. viduata*," "Walnut, July 31, 1882, *C. viduata*," and "9235, *maestosa*, hickory."

*Distribution*.—Eastern half of the United States but rare in the north; commoner in Texas and the Gulf States.

*Food plants*.—Hickory and walnut.

#### CATOCALA AGRIPPINA Stkr.

Head 4.0 to 4.3 mm. broad. Body about 65 mm. long and 8 mm. broad at middle, tapering posteriorly; skin smooth; general color indeterminable.

Dorsum to base of prolegs rather uniformly marked with elongate dark flecks which have a definite tendency to form longitudinal black lines throughout particularly in the line of the spiracles where the dark color is intensified. The usual light and dark stripes but vaguely indicated. Spiracles brown. A low transverse ridge present on the dorsum of abdominal segment 5. Lateral fringe present but very sparse. Color of venter not determinable. Setigerous tubercles I and II red, very large and strongly conical throughout on the abdomen, the dorsal length of II on 8 equal to approximately one and two-thirds times the height of the spiracle on this segment (51:31). Head obscurely, coarsely granulose, with a small but distinct reddish protuberance immediately posterior to seta P<sup>1</sup> and with about seven brownish longitudinal stripes on each side.

Described from three alcoholic larvae from the U. S. National Museum collection, "Larvae defoliating bitter pecan trees. Lucre, Miss. (near Vicksburg) R. A. St. George, 17 June 1924. Hopk. U. S. No. 10095n."

*Distribution*.—Texas and the Gulf States extending up the Mississippi Valley to Missouri, also recorded from Pennsylvania, New Jersey, and Ohio.

*Food plants*.—Pecan and probably other species of hickory.

#### CATOCALA HABILIS Grt.

Head 4 mm. broad. Body about 50 mm. long and 6.5 mm. broad at middle, tapering posteriorly; skin smooth; general color dark brown.

Dorsum to and including base of prolegs flecked closely with black. The usual dark and pale longitudinal stripes traceable but not prominent, the black stripe including the spiracles most distinct. Venter white with the usual segmental dark spots. Spiracles brown. Lateral fringe absent. Middorsal prominence on 5 absent. Dorsal setigerous tubercles yellowish, I and II very small, I being minute and flat throughout and II with a small, slightly elevated sclerotized area on anterior abdominal segments, II on 8 small and but slightly elevated, the dorsal length equal to but one-fourth the height of the spiracle on this segment (5:20). Head coarsely granulose, not protuberant between P<sup>1</sup> and P<sup>2</sup>, pale, with a partially reticulate black U-mark margining the face laterally and dorsally, otherwise reticulate with brown becoming darker posterior to the ocelli.

Described from one inflated larva in the U. S. National Museum collection, "G. M. Dodge, Louisiana, Mo."

*Distribution*.—Ontario and Quebec to Virginia and Kansas.

*Food plants*.—Hickory and walnut.

#### CATOCALA ROBINSONI Grt.

Head 5.2 mm. broad. Body about 55 mm. long and 6 mm. broad at middle, tapering posteriorly; skin smooth; general color rather pale brown.

Dorsal coloration to base of prolegs made up of or well covered by dark dots, the usual longitudinal stripes traceable but not prominent. The dark stripe

including I and II with a black line at ventral margin and that including III and the spiracles most distinct. Spiracles apparently black. Venter pale with the usual segmental dark spots. Anal shield conspicuously marked with red. Lateral fringe absent. Middorsal prominence on 5 absent. Setigerous tubercles I and II minute on anterior abdominal segments mere setal insertions not surrounded by a sclerotized area, II on 8 comparatively very small, the dorsal length equal to less than half the height of the spiracle on this segment (11:26). Head coarsely granulose, not protuberant between  $P^1$  and  $P^2$ , pale, the face marked with brown and margined laterally and dorsally by a black inverted U-mark; a white mark beside basal half of front; other markings not determinable.

Described from one inflated larva in the U. S. National Museum, Barnes collection, "June, hickory."

*Distribution*.—From Ontario and the eastern States through the Ohio and Mississippi Valleys.

*Food plants*.—Walnut and hickory.

#### CATOCALA JUDITH Stkr.

The material from which this description is made may be immature.

Head 3.0 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color dark gray.

Body to base of prolegs closely flecked and reticulate with black. The usual longitudinal stripes faintly indicated. Venter pale with segmental dark spots. Spiracles infuscated brown. Lateral fringe absent. Middorsal prominence on 5 absent. Setigerous tubercles I and II white, moderately large, I nearly flat throughout, dorsal length of II on 8 equal to somewhat more than one-half the height of the spiracle on this segment (13:21). Head smooth but probably coarsely granulose in the last instar if the present specimens are immature, not protuberant between  $P^1$  and  $P^2$ , pale, striped and reticulate with reddish except in a black area above base of antenna.

Described from three inflated larvae in the U. S. National Museum collection, "G. M. Dodge, Louisiana, Mo."

*Distribution*.—Ontario, and Quebec, Canada, throughout the eastern United States and in the Ohio and Mississippi Valleys.

*Food plants*.—Hickory and walnut.

#### CATOCALA RESIDUA Grt.

Head 4.3 mm. broad. Body about 45 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color pale gray.

Middorsal pale stripe nearly obliterated on anterior two-thirds of abdominal segments by the overlying black flecks, appearing as a small spot at posterior margin of segments. Dark stripe including I and II obscure, with the color strongly intensified posterior to II on each segment. Pale longitudinal stripes from ventrad of II to dorsad of III obscure, overlaid by black flecks which tend to form longitudinal lines. Dark stripe including III and the spiracle distinct, made up of three longitudinal black lines. Spiracles dark brown or black. Venter pale with the usual dark spots. Lateral fringe absent. Middorsal prominence on 5 absent. Setigerous tubercles I and II yellow, I well-formed, circular in outline, somewhat elevated and broadly convex throughout, II similar but larger with the dorsal length on 8 equal to approximately two-thirds the height of the spiracle on this segment (16:25). Head pale, coarsely granulose laterally, in the mature larva but quite smooth in the preceding instar, not protuberant between setae  $P^1$  and  $P^2$ , not striped but with about seven slender dark longitudinal lines on each side which form reticulation posteriorly; arising above the antennal insertion, including  $A^2$  and ending half way up the cheek at or near seta  $L^1$  is an intensely black stripe.

Described from three alcoholic larvae from A. E. Brower "*C. residua*, Madison, N. J. 1939, Chas. Rummel Coll.," and two skins cast at pupation from the U. S. National Museum.

*Distribution.*—Throughout most of the Eastern States and the Ohio and Mississippi Valleys.

*Food plant.*—Hickory.

#### CATOCALA PALAEOGAMA Gn.

Head 4 mm. broad. Body about 55 mm. long and 7 mm. broad at middle, tapering posteriorly; skin smooth; general color dark gray.

Body to base of prolegs marked closely with black dots. The usual longitudinal stripes traceable but indistinct. An area posteriorly on 5 and anteriorly on 6 suffused with black dorsally to the prolegs. Venter pale with the usual segmental dark spots. Spiracles black. Lateral fringe present. Middorsal prominence on 5 a low transverse ridge. Setigerous tubercles I and II red, large and distinctly elevated throughout, the dorsal length of II on 8 equal to much more than the height of the spiracle on this segment (37:26). Head coarsely granulose, not protuberant between  $P^1$  and  $P^2$ , pale, suffused, and striped with purplish.

Described from three inflated larvae in the U. S. National Museum collection, "Hickory, Dodge, Louisiana, Mo."

*Distribution.*—Much of the eastern half of the United States; more common in the Northern States, and Ontario, Canada.

*Food plants.*—Hickory and walnut.

#### CATOCALA RETECTA Gt.

Head 5 mm. broad. Body about 60 mm. long and 8 mm. broad at middle, tapering posteriorly; skin smooth; general color dark gray.

Dorsum to base of prolegs flecked with black except that the black flecks are partially replaced by pink in the pale middorsal stripe, the pale stripe between II and III, and in the pale stripe ventrad of the spiracles. The usual longitudinal stripes traceable but not prominent. The middorsal pale stripe and bordering dark stripes much more distinct posteriorly on each of the anterior abdominal segments, the latter also more distinct posterior to II on 5 and anteriorly on 6. No black saddle on 5 and 6. An obscure black line posterior to II on 8. Spiracles apparently white. Venter white with the usual segmental dark spots. Lateral fringe present. Middorsal prominence in 5 absent. Setigerous tubercle white with red about the base, I and II moderately large and distinctly elevated throughout, the dorsal length of II on 8 equal to approximately one-half the height of the spiracle on this segment (17:29). Head coarsely granulose, orange and not protuberant between  $P^1$  and  $P^2$ , pale, with about seven longitudinal dark purplish stripes on each side tending to break into reticulation posteriorly, a narrow black margin above antennal insertion produced as an intensely black stripe including seta  $A^1$  and extending halfway up the cheek to seta  $L^1$ . This black stripe represents a portion of a black U-mark bordering the face which is further indicated by a darkening of the purple markings laterally on the upper face.

Described from one inflated larva, "Stanhope, N. J., VII.10." Chas. Rummel, collector.

*Distribution.*—Much of the eastern half of the United States, extending into Ontario and Quebec.

*Food plant.*—Hickory.

#### CATOCALA VIDUA A. & S.

Head 5 mm. broad. Body about 55 mm. long and 8 mm. broad at middle, tapering posteriorly; skin smooth; general color pale gray probably tinged with pink.

Dorsum to and including base of prolegs flecked rather sparsely with pink, this color becoming more pronounced ventrad of the spiracles and less so dorsally where the dark markings are black and suffused with pink. The usual longitudinal stripes traceable but generally subdued although the dark markings are strong in a black saddle posteriorly on 5 and anteriorly on 6; the stripe including I and II is strong and black posterior to II on 1 and 2 and the lower margin of

the dark stripe including III and the spiracles is black across the spiracles. Spiracles apparently white. A dark line posterior to II on 8. Venter pale with the usual segmental dark spots. Fringe present. Middorsal prominence on 5 absent. Setigerous tubercles white with red about the base, of moderate size, I distinctly but not strongly elevated throughout, the dorsal length of II on 8 equal to approximately half the height of the spiracle on this segment (17:29). Head coarsely granulose, not protuberant between P<sup>1</sup> and P<sup>2</sup>, pale, with about seven dark brown or purplish longitudinal stripes on each side breaking into reticulation posteriorly. A narrow black margin above base of antennae produced as a short intensely black stripe to A<sup>3</sup> above the ocelli, thence continued dorsally as a brown or purple stripe.

Described from one inflated larva, "Green Village, N. J.," Chas. Rummel, collector.

*Distribution*.—Eastern half of the United States, extending into Ontario.

*Food plants*.—Hickory and walnut.

#### CATOCALA HERODIAS Stkr.

Head 3.6 mm. broad. Body about 40 mm. long and 5 mm. broad at middle tapering posteriorly; skin smooth; general color pale greenish gray.

In the specimens at hand the ordinary light and dark longitudinal stripes are scarcely traceable. Spiracles infuscated brown. Lateral fringe pink. Venter white tinged with pink. Middorsal prominence on 5 transverse basally, produced medially to form a thick, bluntly pointed structure drooping posteriorly, dorsal length of the entire elevation equal to twice the height of the spiracle on this segment or somewhat more (40:18). Setigerous tubercles I and II yellowish, small and nearly flat on the skin on anterior abdominal segments, II on 8 moderately large, the dorsal length equal to somewhat less than the height of the spiracle on this segment (13:18). Head coarsely granulose, rather strongly protuberant between P<sup>1</sup> and P<sup>2</sup>, face nearly flat; a brownish U-mark margining face laterally and dorsally, darker in a line at outer margin and margined inwardly by a white stripe arising above antennal insertion and extending dorsally to include the protuberance; dark lines margining the adfrontal areas, a median dark line on front, otherwise brown with lines of pale spots made up of aggregations of coarse granules.

Described from five alcoholic larvae, "Lakehurst, N. J., Scrub oak," Frederick Lemmer, collector, and one inflated larva, "Lakehurst, N. J., VII.10," Chas. Rummel, collector.

*Distribution*.—Texas, New Jersey, and New York.

*Food plant*.—Scrub oak.

#### CATOCALA AHOLIBAH Stkr.

Head 5.0 mm. broad. Body about 55 mm. long and 8 mm. broad at middle, tapering posteriorly; skin smooth; general color light gray.

Coloration to base of prolegs a uniform light gray sparsely dotted with black, each black dot margined with white, the usual light and dark stripes barely indicated. Spiracles black. Lateral fringe white. Venter white tinged with pink. Middorsal prominence on 5 transverse, dome-shaped medially and tending to droop posteriorly, closely marked with black. Posterior to this prominence on 5 the dark coloration is somewhat intensified extending obliquely downward across the spiracle on 6. Dorsal setigerous tubercles black margined with white, moderately large and elevated throughout dorsally, II on 8 very large and set on a hump, the dorsal length of the sclerotized part decidedly greater than height of spiracle on this segment (34:24). Head plumbeous coarsely granulose, median line strongly depressed on occiput, but faintly protuberant between P<sup>1</sup> and P<sup>2</sup>, a black spot surrounding P<sup>2</sup>, the usual black U-mark margining face usually completely absent laterally, very strong dorsally, white freckles composed of coarse granules forming lines anteriorly.

Described from 18 live larvae. Moths determined by A. E. Brower. Mature larvae are found in Washington from the latter part of May to early in June.

*Distribution.*—United States: Colorado, New Mexico, and Arizona, westward to Washington, Utah, and California. Canada: British Columbia.

*Food plant.*—Oak.

#### CATOCALA ILIA (Cram.)

Head 4.1 mm. broad. Body about 55 mm. long and 8 mm. broad at middle, tapering posteriorly; skin smooth; general color pale gray.

The usual light and dark stripes very irregular, not conspicuous, indicated by their dark margining lines, better defined posteriorly on 5 and anteriorly on 6. Spiracles apparently white or pale brown. Lateral fringe white, the filaments short. Venter pink with the usual segmental dark spots. Middorsal prominence on 5 a very low transverse ridge very faintly elevated medially. Setigerous tubercles I and II brown, decumbent and distinctly elevated throughout, the dorsal length of II on 8 equal to the height of the spiracle on this segment (28:28). Head pale, obscurely, coarsely granulo-se, not at all protuberant between P<sup>1</sup> and P<sup>2</sup>; this area white; with a black U-mark, broken by pale spots, margining face laterally and above, black reticulation on the sides, a black spot above antennal insertion and obscure dark markings on the face dorsally.

Described from 3 alcoholic larvae, "Bar Harbor, 1933," from A. E. Brower, and 3 alcoholic larvae, "Pembroke, Ky., April 19, 1922," K. B. McKinney, collector.

*Distribution.*—United States: Minnesota southward to Florida, Missouri, Kansas, and Texas. Canada: Newfoundland, Quebec, and Ontario.

*Food plant.*—Oak.

#### CATOCALA CEROGAMA Gn.

Head 3.5 mm. broad. Body about 50 mm. long and 6.5 mm. broad at middle, tapering posteriorly; skin transversely striate; general color pale gray.

The usual longitudinal light and dark stripes obscure, tending to be reduced to their slender, broken black marginal lines these including a middorsal line and 7 lateral lines on each side. Spiracles black. Lateral fringe present. Venter pale with the usual segmental dark spots. Middorsal prominence on 5 all but absent, a very slight transverse ridge. Setigerous tubercles I and II very small and flat on the skin on abdominal segments 1 to 6, II on 8 very large, conical and set on a hump, the dorsal length of the sclerotized part equal to much more than the height of the spiracle on this segment (60:39). Head pale, sparsely coarsely granulo-se, very slightly protuberant between P<sup>1</sup> and P<sup>2</sup>, black U-mark margining face slender and broken laterally, absent posteriorly; black lines margining adfrontal areas extended dorsally to include P<sup>1</sup>, a black line with A<sup>2</sup> in anterior end, a black median line on front, a few black flecks on the occiput medially and on sides of head dorsally.

Described from 1 alcoholic larva, "Ithaca, N. Y., 1939, *Tilia americana*," from J. G. Franclemont, and 1 inflated larva, "Vinton, Iowa," in the U. S. National Museum, Barnes collection.

*Distribution.*—Manitoba, Ontario, and Quebec, Canada, southward through the New England States to Virginia and westward in the Ohio Valley to Missouri.

*Food plant.*—Linden (*Tilia americana*).

#### CATOCALA RELICTA Wlk.

Head 4.7 mm. broad. Body about 60 mm. long and 7 mm. broad at middle, tapering posteriorly; skin smooth; general color quite pale, probably pale greenish gray.

The usual light and dark stripes almost completely absent, sometimes faintly indicated on 1 and 2. A dark saddle across dorsum of 5 posteriorly, extending obliquely across the spiracle on 6, a black line posterior to II on 8. Other dorsal black markings fragmentary or absent. Spiracles black. Lateral fringe present. Venter pink with the usual segmental dark spots. Prominence middorsally on 5 a low transverse ridge very slightly elevated medially. Setigerous tubercles I and II apparently pale, very small and but slightly elevated throughout, the dorsal length of II on 8 equal to but little more than one-third the height of the spiracle on this segment (22:63). Head apparently brownish, very strongly, coarsely granulose, not protuberant between P<sup>1</sup> and P<sup>2</sup>, this area white, a black U-mark margining the face laterally and above, heavily reticulate with black both anterior and posterior to this mark.

Described from 1 inflated larva, "No. 39866," in the U. S. National Museum collection, H. G. Dyar, collector; 2 alcoholic larvae, "Bar Harbor, Maine, 1935," A. E. Brower, collector; and 1 inflated larva, "Stanhope, N. J., VII.10," Chas. Rummel, collector.

*Distribution.*—British Columbia, Alberta, Manitoba, Ontario, and Quebec, Canada, southward to Washington, Montana, the Middle West north of Illinois and Iowa, and through the New England States to New York, New Jersey, and Pennsylvania; also found rarely in Utah and Colorado.

*Food plants.*—Willow and poplar.

#### CATOCALA AMATRIX (Hbd.)

Head 4.3 mm. broad. Body about 70 mm. long and 9 mm. broad at middle tapering posteriorly, skin smooth, general color brown.

Longitudinal stripes on body rather distinct, all paler near juncture of segments on the abdomen. The pale middorsal stripe strongly constricted medially on anterior abdominal segments forming a series of middorsal pale spots. Dark stripe including I and II darker on posterior half of anterior abdominal segments. A blackish suffusion crossing the dorsum of 5 and descending obliquely across the spiracle on 6. A broad pale stripe, darker in the dorsal half, dorsad of the slender dark stripe including III and the spiracles ventrad of which is a sinuous, slender pale subventral stripe. A dark line posterior to II on 8. Fringe pink. Venter pink (Bentenmuller records it as being orange) with the usual segmental dark spots. Middorsal prominence on 5 a low, uniformly convex ridge crossed by the middorsal and subdorsal stripes. Setigerous tubercle I flat on the skin throughout on abdominal segments, II small anteriorly but rather large and apparently dusky reddish brown on 8 where the dorsal length is equal to somewhat less than the height of the spiracle on this segment (21:26). Head coarsely granulose, with a strong pale protuberance between P<sup>1</sup> and P<sup>2</sup>, dish-faced because of the protuberances above and an elevation across base of front, black U-mark strong laterally tending to fade out dorsally, otherwise brownish broken by pale spots made up of aggregations of coarse granules.

Described from one inflated larva, "Washington, D. C., V. 24, 1902, Bentenmuller," in the U. S. National Museum, and one inflated larva, "New Jersey," Chas. Rummel, collector.

*Distribution.*—The United States east of the Rocky Mountains, including Colorado and Arizona. Canada: Ontario and Quebec.

*Food plants.*—Willow and poplar.

#### CATOCALA CONCUMBENS Wlk.

Head 3.9 mm. broad. Body about 60 mm. long and 7.5 mm. broad at middle, tapering posteriorly; skin smooth; general color brown.

Body to base of prolegs rather uniformly flecked with black, on a brown ground, the usual light and dark longitudinal stripes barely indicated. Spiracles brown. Lateral fringe pink the filaments short. Venter pink with the usual segmental dark spots. A black line posterior to II on 8. Middorsal prominence

on 5 a low uniformly convex, transverse ridge scarcely reaching II. Setigerous tubercles I and II orange, I somewhat elevated throughout on the abdomen, dorsal length of II on 8 usually somewhat less than the height of the spiracle on this segment (22:26). Head coarsely granulose, with a decided orange protuberance between P<sup>1</sup> and P<sup>2</sup>, the face nearly flat with a slight elevation across base of front, a strong black U-mark bordering face laterally and above, a black line with A<sup>1</sup> in anterior end, P<sup>1</sup> in a black spot. Other markings obliterated by the preservative.

Described from three alcoholic larvae, "Kewanee, Wis., 1933," from A. E. Brower, and one inflated larva, "Stanhope, N. J., VII. 10," Chas. Rummel, collector.

*Distribution*.—Quebec, Ontario, and Manitoba, Canada, southward to the Ohio Valley.

*Food plants*.—Willow and poplar.

#### CATOCALA CARA GR.

Head 4.4 mm. broad. Body about 65 mm. long and 7.5 mm. broad at middle tapering posteriorly; skin smooth; general color brown.

Body to base of prolegs marked closely and rather uniformly with small black dots on a brown ground, the usual light and dark longitudinal stripes traceable but not distinct. Spiracles brown. Lateral fringe pale the filaments long. Venter red with the usual segmental dark spots. Middorsal prominence on 5 small but rather prominent, dome-shaped with the base transverse but scarcely reaching II, pale with dark anterior margin. Setigerous tubercles I and II red with pale apices. Strongly elevated throughout on abdominal segments, the dorsal length of II on 8 equal to approximately the height of the spiracle on this segment (25:26). Head coarsely granulose, with a very strong, conical, yellowish projection between P<sup>1</sup> and P<sup>2</sup>, dish-faced owing to the protuberances above and an elevation across base of front, a black U-mark margining face laterally and above, a short black line with A<sup>1</sup> in anterior end, otherwise purple or reddish; this color broken into stripes by rows of yellowish spots composed of aggregations of coarse granules.

Described from 2 inflated larvae in the U. S. National Museum, Barnes collection; 1 inflated larva, "Stanhope, N. J.," Chas. Rummel, collector; and 1 alcoholic larva, "Willow, IX.25.40, Elgin, Ill.," A. K. Wyatt, collector.

*Distribution*.—Eastern half of the United States: Maine, to Florida, South Dakota, Missouri, Kansas, and Texas. Canada: Ontario.

*Food plants*.—Willow and poplar.

#### CATOCALA UNIJUCA Wlk.

Head 4.3 mm. broad. Body about 50 mm. long and 6 mm. broad at middle, tapering posteriorly; skin smooth; general color dark gray.

Middorsal pale stripe very irregular, reticulate with black, strongly expanded anteriorly on abdominal segments. Dark stripe including setigerous tubercles I and II and that including III and the spiracles not well defined; the pale stripe between them covered by black reticulation but traceable. Subventral pale stripe scarcely distinguishable. Venter red with the usual segmental dark spots. Lateral fringe present. Middorsal elevation on abdominal segment 5 a low, transverse ridge, black laterally and orange medially. Setigerous tubercles orange, of moderate size, I somewhat elevated throughout, the dorsal length of II on 8 equal to about three-fourths the height of the spiracle on this segment (35:46). Head coarsely granulose, not protuberant between setae P<sup>1</sup> and P<sup>2</sup>, the black stripe margining the face laterally and dorsally very broad; black lines margining the adfrontal areas; a black line with A<sup>1</sup> in anterior end; reticulate more or less with black laterally posterior to the ocelli.

Described from 6 alcoholic larvae, "State College, Pa., Ex ova. Parent seen," from A. E. Brower, and 2 inflated larvae in the U. S. National Museum, Barnes collection.

*Distribution*.—Quebec, Ontario, Saskatchewan, and Alberta, Canada, southward to North Carolina and Missouri, and rarely in Utah.

*Food plants*.—Willow and poplar.

#### CATOCALA PARTA Gn.

The specimens from which this description is made may be immature. Head 3.8 mm. broad. Body about 60 mm. long and 9 mm. broad at middle, tapering posteriorly; skin bearing large rounded granules, a character not found in any other known species; general color brown.

Middorsal pale stripe with a dark median line, constricted between I and II and somewhat more distinct posterior to this as is also the dark stripe including these tubercles in which a short pale mark arising at II crosses the stripe obliquely. Pale longitudinal stripe from ventrad of II to dorsad of III with a dark median shade. Dark stripe including III and the spiracles narrow, somewhat darker than the subdorsal stripe. From this to base of prolegs closely dotted with black. Venter pink with the usual dark spots. Spiracles apparently white. Lateral fringe present, the filaments very short. Dorsal prominence on 5 a small, low rounded hump. Setigerous tubercle I flat on the skin throughout, II orange, but slightly elevated on anterior segments, the dorsal length on 8 equal to a little more than half the height of the spiracle on this segment (15:23). Head extremely coarsely granulose and rough, scarcely protuberant between setae P<sup>1</sup> and P<sup>2</sup>, with a broad black U-mark margining the face laterally and dorsally, face pale, marked with brown; sides pale, reticulate with brown.

Described from two inflated larvae in the U. S. National Museum, "*C. parta* Gn., ex ova, willow. Barnes collection." One specimen bears the date, V.3.1910.

*Distribution*.—United States east of the Mississippi River and north of the South Atlantic and Gulf States.

*Food plants*.—Willow and poplar.

#### CATOCALA LUCIANA Stkr.

Head 3.6 mm. broad. Body about 50 mm. long and 6 mm. broad at middle, tapering posteriorly; skin smooth; general color pale gray.

A pale middorsal stripe including a median line of dark flecks. Stripes composed of black flecks including setigerous tubercles I and II and including III and the spiracles, traceable but not prominent. Spiracles infuscated brown. Venter pink with the usual segmental dark spots. Cervical and anal shields apparently orange. Ventral fringe with about 17 to 26 filaments on each side on abdominal segment 2. A curved black transverse line posterior to II on 2. Setigerous tubercles orange, comparatively small, I flat on the skin or nearly so, II on 8 attached to the skin for its entire length, the dorsal length equal to not more than one-half the height of the spiracle on this segment (22:45). Middorsal prominence on 5 a transverse ridge, slightly, roundly elevated medially. Head pale, coarsely granulose; with a slender black U-mark, broken dorsally, margining the face laterally; a black median line on front and sometimes with black reticulation posterior to the ocelli.

Described from six alcoholic larvae, "Chicago, Ill., June 5-29, 1936. On poplar." A. K. Wyatt, collector.

*Distribution*.—United States: Montana, Minnesota, and Illinois, through the prairie States west of the Mississippi River to the base of the Rocky Mountains and southward to Kansas. Canada: Manitoba.

*Food plants*.—Willow and poplar.

## CATOCALA NEVADENSIS Beut.

Head 4 to 4.2 mm. broad. Body about 50 mm. long and 7.5 mm. broad at middle, tapering posteriorly; skin smooth or with very minute granules; general color pale gray.

General color white or very pale gray with sparse, rather large, black flecks rather uniformly distributed, the usual dark and pale stripes being almost entirely absent. A dark transverse dorsal saddle partially including abdominal segments 5 and 6. A curved, transverse, black line posterior to setigerous tubercles II on 8. Spiracles pale brown or dark infuscated brown. Venter white, sometimes tinged with pink, with the usual dark segmental spots. Fringe white. Middorsal elevation on 5 a low, transverse ridge dome-shaped medially, dark with the apex brownish. Setigerous tubercles small, I flat on the skin on anterior abdominal segments. II on 8 brown or orange brown, attached to the dorsum for nearly the entire length, the dorsal length equal to more than one-half the height of the spiracle on this segment (34:50). Head white, coarsely granulose, with an orange or brown protuberance between setae P<sup>1</sup> and P<sup>2</sup>; black U-mark margining the face unusually broad, broken by pale spots; black reticulation present posterior to the ocelli.

Described from five live larvae collected in Washington. Moths determined by A. E. Brower. Larvae are mature from early in June to the latter part of June.

*Distribution*.—United States: Washington, Oregon, and California. Canada: British Columbia.

*Food plant*.—Poplar.

## CATOCALA ALIUSA Hls.

Head 3.7 mm. broad. Body about 50 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color pale, uniform, greenish gray.

Markings not at all conspicuous, the darker coloration composed of small dots. Middorsal elevation on abdominal segment 5 a low transverse ridge somewhat elevated medially and somewhat darker than surrounding parts. Setigerous tubercles small, pale, tinged with pink basally, I flat on the skin on anterior abdominal segments, the dorsal length of II on 8 equal to slightly more than one-half the height of the spiracle on this segment (27:45). Spiracles whitish. Venter greenish white with conspicuous dark purplish segmental spots. Ventral fringe fine, white, tinged with pink. A dark line arising dorsad of the spiracle on 8 and traversing the dorsum posterior to II. Head pale, coarsely granulose with a distinct orange protuberance between setae P<sup>1</sup> and P<sup>2</sup>; a slender black U-mark margining the face laterally and above and obscure dark markings both anterior and posterior to this.

Described from nine live larvae. Moths determined by A. E. Brower. Eggs obtained IX.23.43 by A. Herz, while visiting in Seattle, Wash., began hatching May 2, 1944, and all larvae were mature by the latter part of July, the moths emerging late in August.

*Distribution*.—United States: Washington, Oregon, and California; also recorded from Colorado. Canada: British Columbia.

*Food plants*.—Willow and poplar.

## CATOCALA IRENE Behr.

Head 3 to 3.3 mm. broad. Body about 45 mm. long and 7 mm. broad at middle, tapering somewhat posteriorly; skin set closely with minute granules; general color brownish varying to pale gray.

All markings subdued in the mature larva, more distinct in earlier instars, composed of small black flecks on a brownish ground. Middorsal pale stripe strongly constricted about midway between the transverse line of setigerous tubercle I and that of II, otherwise about parallel margined and tending to form a paler spot posteriorly on some abdominal segments. Dark stripe including I and II darker posterior to II. The broad gray stripe between II and III with an obscure,

dark median line. A narrow dark stripe including III and the spiracles. Spiracles pale brown with the extreme centre darker. The narrow, pale subventral stripe not contrasting strongly with the remainder of the subventral area. Venter faintly purplish gray with segmental black spots. A transverse black line posterior to II on 8. Dorsum of 5 and 6 concolorous with other segments. Fringe white faintly tinged with pink. Dorsal prominence on 5 a low, transverse ridge paler than adjacent parts. Setigerous tubercles small, pale gray, I flat on the skin throughout or somewhat convex, the dorsal length of II on 8 (anterior margin to seta) equal to one-half the height of the spiracle on this segment or slightly more (25:44).

Head gray, coarsely granulose with a distinct pale orange protuberance between setae  $P^1$  and  $P^2$ ; a slender black U-mark margining the face and broken into reticulation dorsally; face and lateral areas with obscure markings somewhat dark but not approaching black; mandible black except the setal area.

Described from about 40 larvae collected near Richland, Wash., in May and June. Moths emerged in July, and were determined by Brower.

*Distribution.*—Utah, Arizona, California, and Washington.

*Food plant.*—Willow.

#### CATOCALA BABAYAGA SIKI.

Head 3.7 mm. broad. Body about 60 mm. long and 8 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color brownish or brownish gray varying to clear, dark gray.

All dorsal markings are obscured on about the anterior half of abdominal segments; the broad, middorsal stripe appearing as a segmental series of brownish spots on posterior half of abdominal segments and the irregular black stripe including setigerous tubercles I and II may be similarly reduced to a series of black spots. The broad pale stripe between II and III is paler ventrad of the diffuse, median dark line. An irregular dark stripe including III and the spiracles. Spiracles infuscated brown. Venter to base of prolegs of dilute dorsal coloration. Midventer purple with purplish median spots. Fringe pale. Prominence on abdominal segment 5 a low, transverse ridge directed slightly posteriorly, pale, reticulate with dilute orange. Setigerous tubercles small, pale brownish, black laterally; I flat on the skin on anterior abdominal segments, the dorsal length of II on 8 equal, at most, to but little more than the height of the spiracle on this segment.

Head roughened, distinctly protuberant between setae  $P^1$  and  $P^2$ , pale, with a strong, narrow, black U-line margining the face laterally and above and dull plumbeous reticulation both anterior and posterior to this line, the protuberances between  $P^1$  and  $P^2$  dull yellowish.

Described from six larvae collected near Superior, Ariz., in May. Moths emerged in June, and were determined by Brower.

*Distribution.*—Arizona.

*Food plants.*—Willow and poplar.

#### CATOCALA ARIZONAE Grt.

Head 3.4 to 3.6 mm. broad. Body too shriveled for measurement; skin smooth; general color apparently pale gray with sparse black flecks.

The usual dark stripe including setigerous tubercles I and II and that including III and the spiracles ill-defined as are also the pale middorsal and subdorsal stripes. Spiracles apparently white. Venter pink with the usual dark segmental spots. Ventral fringe present. Middorsal prominence on abdominal segment 5 a transverse ridge, somewhat elevated medially. Setigerous tubercles orange, I flat on the skin on anterior abdominal segments, II of but moderate size, the dorsal length of II on 8 equal to little more than one-half the height of the spiracle on this segment (25:45). Cervical shield pale, unmarked. Head pale, without black markings except a slender U-mark which tends to fade out dorsally and may be brownish rather than black; coarsely granulose; strongly protuberant between setae  $P^1$  and  $P^2$ .

Described from six alcoholic larvae from A. E. Brower, "Vineyard, Utah."

*Distribution*.—Arizona, New Mexico, and Utah.

*Food plants*.—Willow and poplar.

#### CATOCALA HERMIA Hy. Edw.

Head 4.0 mm. broad. Body about 60 mm. long and 11 mm. broad at middle, tapering posteriorly; skin smooth; general color pale gray.

The usual markings of the body distinct but very subdued, there being but little contrast between the light and dark longitudinal stripes. A red saddle across abdominal segment 5 posteriorly descending obliquely across the spiracle on 6 and appearing on the prolegs of both segments. A transverse red line posterior to II on 8. The skin about setigerous tubercle II and most of the transverse dorsal ridge on 5 marked with red as are also the cervical shield and anal shield. Spiracles white. Venter pink with the usual dark segmental spots. Lateral fringe present. Middorsal prominence on 5 a low transverse ridge somewhat produced medially and drooping slightly posteriorly. Setigerous tubercles I and II small, I flat on the skin throughout, II orange and distinctly elevated throughout, the dorsal length of II on 8 equal to somewhat more than one-half the height of the spiracle on this segment (15:22). Head coarsely granulose, strongly protuberant between setae P<sup>1</sup> and P<sup>2</sup>, white, face strongly suffused with red and bordered laterally and dorsally by a black U-mark, the apices pale, sides and occiput reticulate with red.

Described from two inflated larvae from the U. S. National Museum collection, both labeled "*C. hermia*, ex ovo, Deer Creek, Provo, Utah. Barnes collection."

*Distribution*.—Central Rocky Mountain States, Colorado, New Mexico, Utah, and Montana.

*Food plants*.—Presumably willow and poplar.

#### CATOCALA VERRILLIANA Grt.

Head 4.1 to 4.4 mm. broad. Body about 35 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin smooth; general color varying from a contrasting black and white pattern through nearly unicolorous gray to almost black.

The following description is drawn from moderately contrasting specimens. With faint pale areas on the dorsum, particularly on abdominal segments 1, 5, and 6; a dark area posteriorly on 5 and anteriorly on 6 and a curved, black, transverse line posterior to II on 8. Middorsal pale stripe obsolete except near juncture of segments. Black stripe including I and II obsolete except from II across the incisure to I of the following segment. Black stripe including III and the spiracles nearly obsolete posterior to the spiracles. Spiracles dusky gray or brown. Subventral pale stripe obscure, very sinuous and not continuous. Venter white or bluish white, the segmental spots dull blackish tinged with red. Lateral fringe white or pinkish white. Dorsal elevation on abdominal segment 5 transverse basally, produced medially to form a thick, subcylindrical, bluntly pointed horn, inclined posteriorly, the dorsal length of the entire elevation equal to three times the height of the spiracle (53:17) or more. Closely posterior to this horn on the same segment is a second, much smaller, horn which will distinguish this species from any other included here. Setigerous tubercle II gray, brown or orange, large throughout, the dorsal length on 8 much greater than height of spiracle on this segment (28:17); the base partially encircled with black. Head white, obscurely, coarsely granulose, scarcely angulate between setae P<sup>1</sup> and P<sup>2</sup> which are in small orange spots; black line margining the face laterally and dorsally broken by reticulation; face and lateral areas usually reticulate with black.

Described from numerous live larvae collected in Washington and Arizona. Moths determined by A. E. Brower. Larvae begin to reach maturity the latter part of June in Washington, and in late April and early May in Arizona.

*Distribution*.—Texas, New Mexico, Arizona, Colorado, California, Oregon, and Washington.

*Food plant*.—Oak.

#### CATOCALA MICRONYMPIA Gn.

Head 2.7 to 2.9 mm. broad. Body about 40 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color pale gray.

Middorsal pale stripe distinct, very irregular in outline, constricted anterior to the transverse line of II on each abdominal segment. The dark stripe including I and II irregular in outline and obscure, the color of the dark flecks intensified posterior to II on anterior abdominal segments and in a darker area posteriorly on 5 and anteriorly on 6. Pale longitudinal stripe between II and III indistinct, irregularly broken through encroachment of the darker coloration, more distinct laterally on 1, 4, and 5, and tending to obliterate the dark stripe including III and the spiracles posterior to the spiracles, this dark stripe obscure, better defined on 5 and 6. Spiracles brown. Venter white tinged with pink in one specimen. Lateral fringe present. A low middorsal hump on 5 with a small bluntly subconical elevation medially. Setigerous tubercles I and II orange with black about the base, small, decumbent, I very slightly elevated on anterior abdominal segments, the dorsal length of II on 8 equal to the height of the spiracle on this segment (16:15). Head smooth, scarcely protuberant between setae  $P^1$  and  $P^2$ , white, the face strongly reticulate with dusky reddish, orange in a small spot posterior to  $P^1$ , margined laterally and dorsally by a slender, divided, black U-mark with the interstices orange, sides and top of head reticulate with red.

Described from two inflated larvae in the U. S. National Museum labeled "*Catocala athara*, live oak, Florida," and "*Catocala fratercula*, Fla., 4.30 (April 1880), Albert Koebele."

*Distribution*.—Most of the eastern half of the United States. Not recorded from north of Massachusetts except from Ontario, Canada.

*Food plant*.—Oak.

#### CATOCALA CHELIDONIA Gr.

Head 2.7 to 2.8 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering posteriorly; skin smooth; general color varying from light gray through rather dark gray to blackish.

Coloration, made up of black dots on a white ground, the dark and light stripes subdued giving an approximately uniform dorsal shade except in a dark area including II, in dark areas posteriorly on 5 and anteriorly on 6, and a dark line posterior to II on 8. The various stripes very irregular—not tending to be parallel-margined. Spiracles brown or infuscated brown. Venter blue with the usual segmental dusky purplish spots. Lateral fringe white or pink. Middorsal prominence on 5 transverse, low, rounded, with a short subconical projection medially drooping posteriorly, closely reticulate with black, the apex usually white. Setigerous tubercle I flat on the skin on anterior abdominal segments, II small except on 8 where it is black basally orange apically with the dorsal length equal to somewhat more than the height of the spiracle on this segment (18:15). Head smooth white, a strong orange protuberance usually present between  $P^1$  and  $P^2$ , but this may be absent, a slender, divided black U-mark margining face laterally and above, a black spot including  $P^1$ , black lines margining adfrontal areas, another with  $A^1$  in anterior end, a black median line on front and usually with black reticulation medially on occiput.

Described from numerous live larvae collected in Arizona. Moths determined by A. E. Brower. Larvae are mature the latter part of April.

*Distribution*.—Arizona.

*Food plant*.—Scrub oak (*Quercus turbinata*).

## CATOCALA MINUTA Edw.

Head 2.4 mm. broad. Body about 35 mm. long and 4 mm. broad at middle, tapering posteriorly; skin smooth; general color gray.

The specimen is not very satisfactory for description of the coloration but all of the longitudinal stripes appear to be obscure. Spiracles dark brown or black. Venter white with the usual dark spots. Lateral fringe present. Middorsally on 5 is a low rounded hump strongly marked with black basally with a small, pale, bluntly subconical elevation medially. Setigerous tubercles I and II orange, small on anterior abdominal segments with I flat on the skin and II decumbent, very slightly elevated and with a small black area posterior to it, the dorsal length of II on 8 less than the basal width and equal to the height of the spiracle on this segment (13:12). Head smooth, not at all protuberant between setae P<sup>1</sup> and P<sup>2</sup>, the face apparently unmarked except for small black spots at the setal insertions, sides and top of head black interspersed with small spots of the pale ground color.

Described from one inflated specimen in the U. S. National Museum labeled "*minuta*, G. M. Dodge, La., Mo."

*Distribution*.—Eastern half of the United States, probably wherever *Gleditsia* grows, and common in the Central Plains States.

*Food plant*.—Honeylocust (*Gleditsia triacanthos*).

## CATOCALA GRACILIS Edw.

Head 2.9 mm. broad. Body about 45 mm. long and 5.5 mm. broad at middle, tapering posteriorly; skin smooth; general color inconspicuous brown.

Body to base of prolegs uniformly brown overlaid with dark dots, the usual dark and pale longitudinal stripes traceable but not distinct. Coloration intensified posteriorly on 5 and anteriorly on 6. A dark line posterior to II on 8. Spiracles infuscated brown. Lateral fringe white. Venter greenish white with the usual segmental dark spots. A small yellowish elevation middorsally on 5. Setigerous tubercle I small, yellow, II of moderate size, red with pale apex, attached to the skin for nearly the whole length on 8 where the dorsal length is distinctly less than the height of the spiracle on this segment (14:20). Head white, smooth, not at all protuberant between P<sup>1</sup> and P<sup>2</sup>; a black U-mark margining face laterally and dorsally, divided to form two lines on dorsal half, a dark median line on front; otherwise striped with brown or reddish anterior to the U-mark and reticulate with the same color posteriorly except darker posterior to the ocelli.

Described from one inflated larva, "Lakehurst, N. J., June 30," Chas. Rummel, collector.

*Distribution*.—Ontario, Canada, to Florida and westward to Pennsylvania and Ohio; reported also from Illinois.

*Food plant*.—Blueberry (*Vaccinium* spp.).

## CATOCALA ULTRONIA (Hbr.)

Head 3.2 mm. broad. Body about 45 mm. long and 5.5 mm. broad at middle, tapering posteriorly; skin bearing minute, close-set granules; general color gray.

Markings obscure except a rather distinct, pale middorsal stripe. Remainder of body overlaid, rather uniformly, with minute dark flecks. Venter red with dark spots. Setigerous tubercle II large, black at base, orange apically, the dorsal length on abdominal segment 8 equal to the height of the spiracle on this segment (20:19). Lateral fringe present. Middorsal prominence on abdominal segment 5 a subcylindrical bluntly pointed, brown horn, the dorsal length equal to nearly three times height of spiracle on this segment (50:18). Head smooth, somewhat angulate in profile, between setae P<sup>1</sup> and P<sup>2</sup>; the black U-mark somewhat divided on dorsal half, the interstices brown; adfrontal areas margined by black lines, a black median line on front.

Described from one alcoholic larva, "Bar Harbor, Me., 1934," from A. E. Brower, and one inflated larva, "Kearny, N. J., VII.10," Chas. Rummel, collector.

*Distribution.*—Eastern half of the United States; also Quebec and Ontario, Canada.

*Food plants.*—Wild cherry, apple, plum, dogwood (*Cornus*) and oak.

#### CATOCALA GRYNEA (Cram.)

Head 3.0 mm. broad. Body about 45 mm. long and 4 mm. broad at middle, tapering posteriorly; skin with minute granules; general color pale gray tinged with pink.

Middorsal pale stripe distinct both on thorax and abdomen, usually margined by definite black lines. Dark stripe including I and II obscure, somewhat better defined posterior to II where the color of the dark flecks is intensified. Other stripes obscure. An area across the dorsum posteriorly on 5 and descending obliquely across the spiracle on 6 somewhat darker with the pinkish accentuated in some specimens. Spiracles white. Venter white, faintly tinged with pink in one specimen. Lateral fringe present. A slender reddish brown horn middorsally on 5, marked with black flecks, particularly at the base. Setigerous tubercles I and II red with orange apices, I flat on the skin or but very slightly elevated on anterior abdominal segments. II distinctly elevated throughout, the dorsal length on 8 equal to the height of the spiracle on this segment (17:16). Head smooth, slightly protuberant between setae P<sup>1</sup> and P<sup>2</sup>; face with dark reticulation which is suffused with pinkish, the pinkish sometimes predominating, the protuberance orange; face margined laterally and dorsally by a black U-mark more or less broken into reticulation, with the interstices brown; sides and back of head pale with dark reticulation.

Described from 5 inflated larvae from the U. S. National Museum labeled as follows: "*C. grynea*, ex ovo, Iowa, Barnes collection," "*C. grynea*, ex ovo, Iowa, Barnes collection," "*C. grynea*, Stage IV, Barnes collection," "*grynea*, La., Mo., Dodge, apple," and "La., Mo., Dodge, apple, 36535."

*Distribution.*—Eastern half of Canada and the United States except the Gulf States and Texas.

*Food plants.*—Thornapple (*Crataegus*) and apple.

#### CATOCALA MIRA Grt.

Head 3.0 mm. broad. Body about 45 mm. long and 4 mm. broad at middle, tapering posteriorly; skin with minute granules; general color pale gray, tinged somewhat with pink toward ventral margin with a small pinkish area about IV.

All longitudinal light and dark stripes obscure, the middorsal pale stripe scarcely traceable except in a small spot at posterior margin of abdominal segments, the color of the dark flecks in the dark stripe including I and II somewhat intensified posterior to II, a darker area across the dorsum posteriorly on 5 descending obliquely across the spiracle on 6. Spiracles white. Venter white with the usual dark spots. Lateral fringe present. A slender middorsal horn on 5, reddish, flecked with black basally. Setigerous tubercles I and II red with orange apices, I nearly flat on the skin on anterior abdominal segments, II distinctly elevated throughout, the dorsal length of II on 8 equal to slightly more than the height of the spiracle on this segment (18:15). Head smooth, somewhat more protuberant between setae P<sup>1</sup> and P<sup>2</sup> than in *grynea* with the protuberance reddish, face with dark reticulation, the interstices brown, and bordered laterally and dorsally by a divided black U-mark with the interstices brown, sides and top of head whitish with dark reticulation.

Described from one inflated larva from the U. S. National Museum labeled "*Catocala mira*, Iowa, Barnes collection."

*Distribution.*—Central Plains States down the Mississippi Valley to Texas, and along the Ohio Valley to Pennsylvania and New York.

*Food plant.*—Thornapple (*Crataegus*).

## CATOCALA BLANDBULA Hbst.

Head 3.3 mm. broad. Body about 35 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin bearing minute, close-set granules; general color gray.

Most of the markings have been obliterated by the preservative, the only conspicuous colorational feature being the black lines bordering the middorsal pale stripe which are much stronger on the posterior half of the abdominal segments. Spiracles brown. Venter white with the usual dark spots. Ventral fringe present. The middorsal prominence on abdominal segment 5 produced medially, forming a broad flattened structure, broad apically and drooping strongly posteriorly with the dorsal length but little greater than the height of the spiracle on this segment (20:16). Setigerous tubercle I somewhat elevated throughout; II conspicuously large and subconical throughout, the dorsal length on 8 much greater than height of spiracle on this segment (42:34). Head smooth, pale, reticulate with purplish, scarcely angulate between setae P<sup>1</sup> and P<sup>2</sup>; the black U-mark broken dorsally by brown or orange spots, black lines margining the adfrontal areas, and a black median line on the front.

Described from 1 alcoholic larva, "Bar Harbor, Me., Ex ova," reared by A. E. Brower.

*Distribution.*—Range uncertain, probably including: Manitoba, Ontario, and Nova Scotia, Canada, through the New England States to the North Atlantic States, Michigan, Wisconsin, and possibly Illinois.

*Food plant.*—Thornapple (*Crataegus*).

## CATOCALA CRATAEGI Saund.

Head 3 mm. broad. Body about 34 mm. long and 4 mm. broad at middle, tapering posteriorly; skin bearing obscure, minute granules, more distinct on the thorax; general color gray.

Middorsal pale stripe and the bordering black stripes including setigerous tubercles I and II indicated but not prominent. Remainder of markings less evident, the dark coloration composed of rather large and sparse dark flecks. Spiracles brown. Venter pale with the usual dark segmental spots. Fringe present. Middorsal prominence on abdominal segment 5 reticulate with black, produced medially forming a thick, bluntly subconical projection drooping posteriorly, dorsal length of prominence equal to approximately twice the spiracle height (22:12). Setigerous tubercles small to minute throughout except II on 8 and 9; I flat on the skin throughout; the dorsal length of II on 8 much less than height of spiracle on this segment (17:23). Head pale, smooth, scarcely protuberant between setae P<sup>1</sup> and P<sup>2</sup>; black U-mark margining face laterally and dorsally broken above seta A<sup>2</sup> by brown dots; adfrontal areas margined by black lines and a median black line on the front.

Described from 1 alcoholic larva, "Chicago, VI.10.41, On thorn-apple," A. K. Wyatt, collector.

*Distribution.*—Uncertain, apparently including: Manitoba and Nova Scotia, extending through the New England and North Atlantic States and westward to Pennsylvania and Illinois.

*Food plants.*—Thornapple (*Crataegus*) and apple.

## CATOCALA PRAECLARA G. &amp; R.

Head 2.85 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering strongly posteriorly; skin bearing minute, close-set granules; general color pale gray.

The usual pattern of light and dark markings present, the pattern to base of prolegs being overlaid rather uniformly by minute dark flecks which do not tend to form longitudinal lines. A very sinuous subventral stripe is indicated. Spiracles apparently brown. A slender, transverse, curved, brown line is present posterior to setigerous tubercles II on abdominal segment 8. Venter white tinged

with pink, with the usual series of dark purplish median spots. Lateral fringe present. A thick, bluntly subconical, brown prominence middorsally on 5, drooping posteriorly, the dorsal length equal to twice the height of the spiracle on this segment. Setigerous tubercles small, II on 8 attached to the dorsum for its entire length, the length much less than height of spiracle on this segment (22:30). Head smooth, white, somewhat angulate in profile between P<sup>1</sup> and P<sup>2</sup>, the black U-mark divided by a brown line on dorsal half; with translucent reticulation posteriorly, the face white with the strong black margin to the adfrontal areas broadened dorsally and a median brown or purplish line on the front.

Described from one inflated larva, "Green Village, N. J., VI.20," Chas. Rummel, collector.

*Distribution*.—Nova Scotia through the New England and North Atlantic States.

*Food plant*.—Thornapple (*Crataegus* spp.)

### CATOCALINAE, GROUP 5

- |   |                    |
|---|--------------------|
| 1. Prolegs absent on abdominal segment 3.....   | 4                  |
| Prolegs present on abdominal segment 3.....   | 2                  |
| 2. Spinneret with an open, apical silk pore. Head with a large dorsal area each side of the median line roughened by slender, parallel, transverse, elevated lines. Hind coxae half the femur width apart or more (10:20) Feed on persimmon.....                          | <i>Hypsoropha</i>  |
| Silk pore of spinneret concealed. Head not roughened dorsally by transverse, elevated lines. Hind coxae touching or nearly so.....  | 3                  |
| 3. Dorsal setigerous tubercles minute. Setigerous tubercle VII <sup>c</sup> almost directly anterior to VIII on abdominal segment 1. Mandible with a basal process bearing an apical molar area. Of northern distribution. Feeds on meadow rue ( <i>Thalictrum</i> )..... | <i>Calpe</i>       |
| Dorsal setigerous tubercles rather large. Setigerous tubercle VII <sup>c</sup> far from anterior to VIII on abdominal segment 1. Mandible with two basal teeth, one of these often shelflike. Of southern distribution. Feeds on beans and related plants.....            | <i>Anticarsia</i>  |
| 4. Prolegs present on abdominal segment 4. Front remarkably broadened on basal half (pl. 10, II), the disc flat. Occurs in Florida only....   | <i>Gonodonta</i>   |
| Prolegs absent on abdominal segment 4. Front narrowing gradually from base to apex, a gibbous median area present. Of much wider distribution.  | <i>Plusiodonta</i> |

### HYPSOROPHA Hbn.

Head with black submedian arcs and full black reticulation..... *hormos*  
 Black markings on head confined to a conspicuous, rounded spot with P<sup>1</sup> in posterior margin and a black mark at the ocelli..... *monilia*

### HYPSOROPHA HORMOS Hbn.

Head 2.7 mm. broad. Body about 2.5 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin smooth; general color green with dark markings.

Occurs in a green form and in a darker form in which the markings described below are largely obscured in the general dark reticulation. In the green form small purplish spots are present subdorsally on abdominal segments, these spots being fused across the dorsum on 5 and 8, including setigerous tubercle I, and occurring in similar position on each thoracic segment. Spiracles orange with brown rim. A small, purplish black spot dorso-anterior to each abdominal spiracle. Head green, with black submedian arcs and full black reticulation.

Described from six inflated larvae in the U. S. National Museum labeled variously; "No. 2562, July-September 1882, Va.," "4403, Noctuid on sassafras, Cadet, Mo.," and "Piney Point, Md., July 27, 1884."

*Distribution*.—Texas, Florida, Georgia, North Carolina, Tennessee,

Kentucky, Virginia, Maryland, Pennsylvania, Illinois, Missouri, Kansas, New York and New Hampshire.

*Food plant.*—Persimmon (*Diospyros*); the occurrence on sassafras probably accidental.

#### HYPSOROPHA MONILIS (F.)

Head 2.7 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color rather dark but may occur, also, in a more definitely spotted green phase as in *hormos*.

Body flecked generally with small pale spots. Dorsum to and including setigerous tubercle II black, the middorsal pale stripe indicated by broken, marginal, pale lines. Ventrad of II and not reaching III is a broad pale stripe. A black stripe including III. Remainder of body paler than the dorsum, of a blackish or brownish shade, paler on the venter. Spiracles apparently brown with black rim. Cervical shield and anal shield black. Head with a conspicuous, rounded, black spot including seta P<sup>1</sup> in posterior margin and extending beside the adfrontal areas for more than half their length, the ocelli included in a black spot.

Described from two alcoholic larvae in U. S. National Museum labeled "Island Grove, Fla., May, larva from *Diospyros*, imago III, IV."

*Distribution.*—Texas, Mississippi, Georgia, Florida, North Carolina, Tennessee, and Missouri.

*Food plant.*—Persimmon (*Diospyros*).

#### CALPE Treit.

##### CALPE CANADENSIS Beth.

Head 3.1 mm. broad. Body about 40 mm. long and 6 mm. broad, abdominal segments of about equal width throughout with a rounded dorsal hump on abdominal segment 8; skin smooth; general color white or pale greenish white to well ventrad of spiracles, venter abruptly black.

A longitudinal series of small black spots middorsally, smaller or absent posteriorly on the abdomen except on 8. A series of about 4 transverse black lines and a black spot on each segment form a longitudinal stripe dorsad of the black spiracles. Setigerous tubercles minute. Head smooth, pale, with a transverse black spot dorsally between setae P<sup>1</sup> and P<sup>2</sup>, and additional black spots opposite base of front and below the ocelli; front mostly black.

Described from 5 inflated and 1 alcoholic larva in U. S. National Museum labeled variously: "3125, Cabin John Bridge, Md., May 25, 1898"; "3608"; "Larva on *Thalictrum*, 3125"; and "Unionville, Pa., July 16, 1915, on meadowrue, Mrs. Woolaston, coll."

*Distribution.*—United States: Illinois, Maryland, New Jersey, Pennsylvania, New York, Connecticut, Massachusetts, New Hampshire, Maine, and Minnesota. Canada: Quebec, Manitoba, and Alberta.

*Food plant.*—Meadowrue (*Thalictrum*).

#### ANTICARSIA Hbn.

##### ANTICARSIA GEMMATILIS Hbn.

Head 2.6 to 2.7 mm. broad. Body about 25 mm. long and 3.5 mm. broad at middle, tapering posteriorly; skin smooth; general color varying from green through dusky olivaceous gray to brown.

Distinct middorsal and subdorsal pale lines, both narrowly margined by a dusky shade which may be tinged with purple. A pale line slightly dorsad of setigerous

tubercle III, the space between this and the subdorsal pale line slightly darker than remainder of dorsum. Spiracles light yellow with brownish rim, included well within the subventral white stripe which also includes two pink lines, the space between these lines yellowish. Venter, green, unmarked. Setigerous tubercles large, distinctly elevated, II especially large on 7, 8, and 9; margined by a dusky shade. Head green or white with dark submedian arcs dorsally and blackish or purplish reticulation.

Described from nine live mature larvae collected at Baton Rouge, La., in November 1932, by C. E. Smith, and some additional alcoholic and inflated material from various sources.

*Distribution*.—Maine, New York, Pennsylvania, New Jersey, Illinois, Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Arkansas, Louisiana, Texas, and southward.

*Food plants*.—Various beans, alfalfa, and black locust (*Robinia pseudoacacia*).

#### GONODONTA Hbn.

1. With about 12 slender transverse white lines encircling each segment— *unica*  
Without transverse white lines encircling the segments----- *nutrix* (?)

#### GONODONTA UNICA Neum.

Head 3.1 mm. broad. Body about 35 mm. long and 4.5 mm. broad at middle, broadened on abdominal segments 1, 2, and 8 and with a decided dorsal hump on 8; skin smooth; general color black with orange spots and many fine, transverse, white lines.

Coloration uniform throughout except that the venter is somewhat paler than the dorsum and orange spots are absent on the thorax. About twelve slender, transverse, white lines on a black ground on each segment. Abdominal segments with subdorsal orange spots between setigerous tubercles I and II, a similar spot ventrad of the black spiracles, and midventral spots on abdominal segments 1, 2, and 3. Setigerous tubercles minute throughout. Legs and prolegs black, the latter marked with white apically. Head smooth, black, the epipharynx and base of antenna white.

Described from two inflated larvae in the U. S. National Museum labeled "Miami, Fla., Jan. 4, 1908, on *Anona glabra*, P. J. Nester coll."

*Distribution*.—Florida.

*Food plant*.—Pond apple (*Anona glabra*).

#### GONODONTA NUTRIX (Cram.) (?)

The specimen is not positively determined. Head 3.4 mm. broad. Body about 32 mm. long and 3.5 mm. broad at middle, broadened on abdominal segments 1, 2, and 8 with a rounded dorsal lump on 8; skin smooth; general color black with orange spots and without transverse white lines encircling the body.

Abdominal segments with a transverse orange spot between setigerous tubercles I and II; a similar spot ventrad of the black spiracles and small midventral orange spots on abdominal segments 1, 2, and 3. Between each two orange spots on contiguous segments both subdorsally and ventrad of the spiracles are about four white spots, mostly transverse, and these markings are also present on the thorax where the setigerous tubercles are also in small white spots on mesothorax and metathorax. Setigerous tubercles minute throughout. Legs and prolegs black, the latter with faint pale markings apically. Head smooth, black, the epipharynx and base of antenna white.

Described from one inflated larva in the U. S. National Museum labeled "Miami, Fla., Jan. 4, 1908, on *Anona glabra*, P. J. Nester, coll."

*Distribution*.—Florida.

*Food plant*.—Pond apple (*Anona glabra*).

## PLUSIODONTA Gn.

## PLUSIODONTA COMPRESSIPALPIS Gn.

Head 2.1 mm. broad. Body about 30 mm. long and 4.5 mm. broad at middle, tapering posteriorly; skin smooth; general color mingled soft white and black.

A white, transverse dorsal band on abdominal segment 1 including the spiracle; another on posterior half of 3, almost covering 4 and extending obliquely to the proleg on 5 without invading the dorsum of this segment and yet another white area on 7 and 8 extending from subdorsally to and including the spiracles. A black subdorsal spot about midway of each segment from mesothorax to 7. Venter dark. Spiracles white. Setigerous tubercles minute throughout. Prolegs absent on 3 and 4. Head pale, not reticulate but with broad black markings, a white spot opposite apex of front.

Described from 10 inflated larvae in the U. S. National Museum, some of which are labeled "A. H. Verrill, New Haven, Conn., on moonseed vine, 1901," while others are labeled "Plummers Island, Md., No. 2760, on *Menispermum canadense*, June 25, 1882."

*Distribution*.—Georgia, Mississippi, Texas, Kansas, North Carolina, Maryland, New Jersey, Pennsylvania, Connecticut, and New York.

*Food plant*.—Moonseed vine (*Menispermum canadense*). The larva is said to sever the leaves, feeding on them only after the leaves are dry.

## CATOCALINAE, Group 6

1. Crochets on prolegs largest medially in the series and becoming vestigial at the ends, with a crochetless lobe at each end of the series of crochets. Setigerous tubercles minute throughout with the bases of IV and V free on mesothorax and metathorax. Prolegs present on abdominal segment 3.

*Scoliopteryx*

Crochets of approximately equal size throughout the series, without crochetless lobes at the ends. With at least setigerous tubercle II on abdominal segment 8 moderately large and the bases of IV and V confluent on mesothorax and metathorax. 2

2. Prolegs absent on abdominal segment 3. Crochets on prolegs with a large subapical tooth (pl. 6, F) Prolegs present on abdominal segment 3. Crochets on prolegs without a subapical tooth 3

3. Setae P<sup>1</sup> on head farther apart than setae P<sup>2</sup> (35:31). Height of prothoracic spiracle distinctly less than height of spiracle on abdominal segment 8 (21:26). Insertions of head setae in conspicuous black spots.—*Alabama*  
Setae P<sup>1</sup> on head closer together than setae P<sup>2</sup> (49:55). Height of prothoracic spiracle equal to that of the spiracle on abdominal segment 8 (35:35). Insertions of head setae not in black spots.

Genus No. 14 ("*Anomis*" *commoda* Butler)

## SCOLIOPTERYX Germ.

## SCOLIOPTERYX LIBATRIX (L.)

Head 3 mm. broad. Body about 40 mm. long and 5.5 mm. broad at middle, tapering distinctly posteriorly; skin smooth; general color green, the venter with a whitish bloom.

A yellowish line somewhat dorsal of setigerous tubercle III. No other markings. Spiracles light brown, the extreme centre pale. Crochets on prolegs largest medially in the series and abortive at the ends, with a crochetless lobe at each end of the series of crochets. Setigerous tubercles minute throughout. Head grayish green, without markings.

Described from numerous larvae collected both east and west of the Cascade Mountains in Washington in July, August, and early September. Reared moths were determined by Benjamin.

*Distribution.*—United States: Maine, Massachusetts, New York, New Jersey, Pennsylvania, North Carolina, Illinois, Minnesota, Texas, New Mexico, Arizona, California, Utah, Colorado, Washington, Montana, and Alaska. Canada: Nova Scotia, Ontario, Manitoba, Alberta, and British Columbia.

*Food plants.*—Willow, and rarely poplar.

#### ANOMIS Hbn.

1. Setigerous tubercles P<sup>1</sup> on the head distinctly farther apart than tubercles P<sup>2</sup> (33:28). Dorsal length (anterior margin to seta) of setigerous tubercle II on abdominal segment 8 equal to decidedly more than half the height of the spiracle on this segment (17:22). Setigerous tubercles of head and body black or reddish.----- 2
- Setigerous tubercles P<sup>1</sup> on the head distinctly closer together than tubercles P<sup>2</sup> (34:40). Dorsal length of setigerous tubercle II on abdominal segment 8 equal to not more than half the height of the spiracle on this segment (11:22). Setigerous tubercles on body green, the minute annulus surrounding base of setae on head and body often dark in *flava*.----- 3
2. Middorsal white line strong and continuous except that it is widely broken at the segmental incisures. Transverse area enclosed by setigerous tubercles I and II on the abdominal segments paler than the areas anterior and posterior to this on each segment in the one specimen seen.----- *texana*
- Middorsal pale line broken, barely indicated. Transverse area enclosed by tubercles I and II on abdominal segments tending to be as dark as remainder of segment.----- *impasta*
3. The minute annulus surrounding the base of the setae on the cervical shield black. Middorsal pale line margined by dark lines. A dark line dorsad of setigerous tubercle III.----- *flava*
- The minute annulus surrounding the base of the setae on the cervical shield gale brown or green. No dark lines on the body.----- *erosa*

#### ANOMIS TEXANA Riley

Head 2.4 mm. broad. Body about 30 mm. long and 3.5 mm. broad at middle, tapering somewhat posteriorly; skin smooth; general color rather dark in the one specimen seen, probably varying to a green form with white lines as in *impasta*.

Middorsal white line strong but broadly broken at the incisures. Dorsum to well ventrad of setigerous tubercle II dull, infuscated reddish with the area enclosed by I and II paler on each segment giving the dorsum a spotted appearance. A rather strong white line somewhat ventrad of II and a more slender white line ventrad of this in the line of the "extra" setigerous tubercle. Spiracles pale yellow. Traces of a white line well ventrad of the spiracles. Venter paler than the dorsum. Dorsal setigerous tubercles black, somewhat more than mere setal insertions throughout on the abdomen and rather large on 7, 8, and 9. Head reticulate with red, the setigerous tubercles black.

Described from one inflated larva in the U. S. National Museum labeled "From Wm. J. Jones, Virginia Point, Tex., Oct. 18, 1878, 981, *Anomis exacta*, Description taken from."

*Distribution.*—Florida, Texas, and southward into South America.  
*Food plant.*—Cotton (teste Jones).

#### ANOMIS IMPASTA Gn. (DOCTORIUM Dyar)

Head 2.2 mm. broad. Body about 30 mm. long and 3.5 mm. broad at middle, tapering decidedly posteriorly; skin smooth; general color varying from green to reddish.

In the green form, the setigerous tubercles on head and body are black or reddish; the middorsal white line on the body is barely indicated; there is a strong, continuous white line just ventrad of setigerous tubercle II and a similar white line somewhat ventrad of this in the line of the "extra" setigerous tubercles.

Spiracles yellow with brown rim. A white line is present well below the spiracles. In the red form, in addition to the markings described above, the head is reticulate with red and the body is suffused with red in varying degrees, particularly on the dorsum, and the space enclosed by setigerous tubercles I and II tends to be as dark as the remainder of each abdominal segment. The dorsal setigerous tubercles distinctly more than mere setal insertions throughout and rather large on abdominal segments 8 and 9.

Described from 11 inflated larvae in the U. S. National Museum labeled "715, on cotton, Pernambuco, Brazil, Feb. 22, 1883," and 1 inflated larva in the same museum labeled "Anahuac, Tex., Sept. 1, 1918, on *Malvaviscus*, F. H. B."

*Distribution*.—Florida, Texas, and southward.

*Food plants*.—Cotton and *Malvaviscus* (teste Benjamin).

#### ANOMIS FLAVA (F.)

Head 2.8 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, tapering decidedly posteriorly; skin smooth; general color probably green.

Markings on head and body completely removed by the preservative excepting a dark middorsal line including the faint, broken, pale middorsal line and a dark line dorsad of setigerous tubercle III. Spiracles apparently pale brown. Dorsal setigerous tubercles on the abdomen probably green, somewhat more than mere setal insertions and distinctly elevated on posterior segments, with the minute annulus surrounding the base of the setae black.

Described from five larvae from the U. S. National Museum labeled "Okra, Smith Point, Tex., Nov. 1, 1923, L. J. Bottimer, coll."

*Distribution*.—Texas, Louisiana, Florida, Georgia, and Virginia.

*Food plants*.—Cotton, hollyhock, and okra.

#### ANOMIS EROSA Hbn.

Head 2.7 mm. broad. Body about 30 mm. long and 4 mm. broad at middle, tapering decidedly posteriorly; skin smooth; general color green throughout.

Middorsal pale line represented by isolated white flecks. A strong, narrow, continuous white subdorsal stripe. A white line indicated dorsad of the spiracles. Spiracles pale yellow with brownish rim. Well ventrad of the spiracles a sharply defined, continuous white line. Venter green, unmarked. All dorsal setigerous tubercles somewhat more than mere setal insertions, distinctly elevated on posterior segments. Head smooth, green, unmarked.

Described from numerous larvae collected at Clarksville, Tenn., in August and September. Reared moths determined by Dyar.

*Distribution*.—Texas, Kansas, Louisiana, Alabama, Florida, Georgia, North Carolina, Tennessee, Virginia, Maryland, New Jersey, Pennsylvania, New York, and Massachusetts.

*Food plants*.—Hollyhock, *Abutilon*, *Hibiscus*, *Althaea*, and okra.

#### ALABAMA Grt.

##### ALABAMA ARGILLACZA (Hbn.)

Head 2.2 to 2.3 mm. broad. Body about 35 mm. long and 4 mm. broad at middle, tapering posteriorly; skin smooth; general color green, with or without black markings.

Larvae may vary from those entirely without black markings, except the black setigerous tubercles, to others in which only the middorsal white line is margined with black or the dorsum to and including setigerous tubercle II is black or to yet other specimens in which the entire dorsum to the subventral stripe is more or less completely black. Spiracles black. Setigerous tubercles of moderate size, black, the dorsal tubercles broadly conical. Head smooth, yellowish, the setal insertions in prominent, round, black spots.

Described from 12 alcoholic larvae collected at Moss Bluff, Tex., October 7, 1924, on cotton, by K. B. McKinney.

*Distribution.*—Arizona, New Mexico, Texas, Louisiana, Mississippi, Alabama, Georgia, Florida, North Carolina, and Tennessee and southward into South America. Occurring as fall migrants as far north as Canada. The pupae do not survive the winter much north of the southern tier of States.

*Food plant.*—Cotton.

#### Genus No. 14

#### "ANOMIS" COMMODA (Butler)

Head 3.3 to 3.4 mm. broad. Body about 40 mm. long and 5.5 mm. broad at middle, tapering posteriorly; skin smooth; general color indeterminable with certainty but apparently gray or dusky greenish.

A narrow, broken, white middorsal line. A broader white line well ventrad of setigerous tubercle II. Traces of a white line dorsad of III and a narrow, white subventral stripe. Spiracles black. Setigerous tubercles moderately large, somewhat elevated, intense black in white spots. Head smooth, approximately the anterior one-fourth and a line including setae P<sup>1</sup> and P<sup>2</sup> pale; the remainder of a darker shade; setal insertions not in black spots.

Described from four alcoholic larvae reared to maturity at Arlington, Va., May 1948, on *Hibiscus syriacus*, by J. G. Franclemont.

*Distribution.*—Virginia and southward.

*Food plant.*—Rose of Sharon (*Hibiscus syriacus*).

#### Subfamily HERMININAE

1. Setigerous tubercle II<sup>c</sup> ventrad of the margin of the cervical shield (pl. 7, L). Spiracles not emarginate at ends (pl. 9, F) ----- 2  
Setigerous tubercle II<sup>c</sup> on the cervical shield (pl. 7, Q) ----- 4
2. Prolegs present on abdominal segments 3 and 4. Setigerous tubercle VI bearing 3 or 4 setae on prothorax and 2 setae each on mesothorax and metathorax. Bases of setigerous tubercles I<sup>a</sup> and I<sup>b</sup> fused on mesothorax and metathorax. Mandible with 3 small basal teeth arising from ribs 2, 3, and 4. ----- *Litoprosopus*  
Prolegs absent on abdominal segments 3 and 4. Setigerous tubercle VI with the normal 2 setae on prothorax and 1 seta each on mesothorax and metathorax. Setigerous tubercles I<sup>a</sup> and I<sup>b</sup> well separated on mesothorax and metathorax, except in *Metalectra tantillus*. Mandible without a basal tooth or process ----- 3
3. Head and body with numerous secondary hairs. Anterior abdominal segments bearing conspicuous middorsal fleshy processes. Setigerous tubercles P<sup>1</sup> on the head much farther apart than setae P<sup>2</sup> (52:34) ----- *Phyprosopus*  
Head and body without secondary hairs. Without fleshy appendages dorsally on abdominal segments. Setigerous tubercles P<sup>1</sup> somewhat closer together than tubercles P<sup>2</sup> (17:20) ----- *Metalectra*
4. With two fused setigerous tubercles of the VII group on abdominal segment 1 (VII<sup>a-b</sup>). Prolegs absent on abdominal segment 3. Setigerous tubercles P<sup>1</sup>, at most, but slightly farther apart than tubercles P<sup>2</sup> (40:36). Prothoracic spiracle decidedly anterior to the posterior margin of the cervical shield. Spiracles not emarginate at ends ----- 5  
Setigerous tubercles of the VII group well separated on abdominal segment 1. Setigerous tubercles P<sup>1</sup> decidedly farther apart than tubercles P<sup>2</sup>, the interspace P<sup>1</sup>-P<sup>1</sup> usually being nearly twice P<sup>2</sup>-P<sup>2</sup> except in *Phalaenophana* ----- 6
5. Setigerous tubercles I and II distinctly separate on abdominal segment 9. Setigerous tubercle III dorso-anterior to the spiracle on abdominal segment 8 ----- *Saccharophaga*  
Setigerous tubercles I and II fused on abdominal segment 9. Setigerous tubercle III anterior to the spiracle on abdominal segment 8. ----- *Scolecocampa*

6. Prothoracic spiracle on the line of the posterior margin of the cervical shield (pl. 9, E). Spiracles not emarginate at ends (pl. 9, F). Ocellus I flat on the head, not on a callus.----- 7  
 Prothoracic spiracle anterior to the posterior margin of the cervical shield (pl. 9, A-D). Spiracles emarginate at ends except in *Lascoria* (pl. 9, G). Ocellus I inclined posteriorly, on a small callus. Prolegs present on abdominal segment 3.----- 8
7. Prolegs absent on abdominal segments 3 and 4. Spiracles retracted, in a depression in the skin, on anterior abdominal segments. Setigerous tubercle VII<sup>a</sup> on abdominal segment 1 decidedly nearer to VIII than to VII<sup>c</sup>.----- 8  
*Arugisa (Diallagma)*  
 Prolegs sometimes absent on abdominal segment 3 but always present on 4. Spiracles on the surface of the skin. Setigerous tubercle VII<sup>b</sup> on abdominal segment I decidedly farther from VIII than from VII<sup>c</sup>.----- *Epizeuxis*
8. Setigerous tubercles P<sup>1</sup> closer together than tubercles P<sup>2</sup>. Tubercle P<sup>1</sup> decidedly nearer to median line of head than to L<sup>1</sup>. Subanal setae very close together, developed as an anal fork.----- *Phalaenophana*  
 Setigerous tubercles P<sup>2</sup> much farther apart than tubercles P<sup>1</sup>. Tubercle P<sup>1</sup>, at most, but slightly nearer to the median line than to L<sup>1</sup>. Subanal setae usually well separated, rarely developed as an anal fork.----- 9
9. With a distinct middorsal hump on abdominal segment 8. Body tapering posteriorly.----- 10  
 Without a middorsal hump on abdominal segment 8. Body usually broad posteriorly.----- 11
10. Hump on dorsum of abdominal segment 8 including setigerous tubercle I. Setigerous tubercle II on abdominal segment 8 but slightly larger than elsewhere. Granules on the skin subconical or spinelike. Setigerous tubercle VII<sup>a</sup> about twice as near to VII<sup>b</sup> as to VIII on abdominal segment 2. Spiracles emarginate at ends (pl. 9, G).----- *Palthis*  
 Hump on dorsum of abdominal segment 8 including setigerous tubercle II which is much larger on 8 than on preceding segments. Skin bearing minute, rounded granules. Setigerous tubercle VII<sup>c</sup> nearly equidistant between VII<sup>b</sup> and VIII on abdominal segment 2. Spiracles not emarginate at ends, extremely narrow, twice as high as wide.----- *Lascoria*
11. Setigerous tubercles A<sup>1</sup>-A<sup>2</sup>-A<sup>3</sup> forming a very obtuse angle at A<sup>2</sup>. Setigerous tubercle IV on abdominal segment 5 at least about one-fourth nearer to III than to V, measured between the setal insertions. Setigerous tubercle IV usually less than the width of the spiracle removed therefrom. Dorsal setae of body usually blunt or enlarged at tip (pl. 7, E, I).----- 16  
 Setigerous tubercles A<sup>1</sup>-A<sup>2</sup>-A<sup>3</sup> forming approximately a right angle at A<sup>2</sup>. Setigerous tubercle IV on abdominal segment 5 equidistant between III and V or nearer to V, measured between the setal insertions. Setigerous tubercle IV on abdominal segment 4 distinctly more than the width of the spiracle removed therefrom. Setae of body pointed at tip (pl. 7, A-C, G, H).----- 12
12. Subanal setae close together, developed as an anal fork. Anal shield strongly declivous posterior to the antero-dorsal setigerous tubercles. Setigerous tubercles I and II directed posteriorly, their setae stout, bluntly pointed, about twice as long as the width of their tubercles (pl. 7, A, B). Spiracles peculiar, the outer margin embedded in the skin and indistinct.----- 13  
 Subanal setae well separated, not developed as an anal fork. Anal shield not strongly declivous posterior to the antero-dorsal setigerous tubercles. Setigerous tubercles I and II not directed posteriorly except slightly on abdominal segments 7 and 8, their setae slender or very short (pl. 7, H, I).----- 14
13. Abdominal segments of about equal width throughout, with 7 and 8 slightly broadened. Setae I and II directed strongly posteriorly, almost parallel with the dorsum (pl. 7, B).----- *Philometra*  
 Body tapering posteriorly. Setae I and II directed somewhat posteriorly but far from parallel with the dorsum (pl. 7, A).----- *Phalaenostola*
14. Body tapering posteriorly. Anal shield elongate, the posterior setigerous tubercles very strongly produced. Dorsal setae nearly twice as long as the width of their tubercles (pl. 7, C). Spiracles peculiar, the outer margin embedded in the skin and indistinct. Setigerous tubercle VII<sup>a</sup> on abdominal segment 1 nearly equidistant between VII<sup>b</sup> and VIII.----- *Hormisio*

- Body broadened posteriorly. Anal shield rounded, the posterior tubercles not very strongly produced. Dorsal setae no longer than the width of their tubercles (pl. 7, J). Spiracles normal, the outer margin sharply defined. Setigerous tubercle VII<sup>b</sup> on abdominal segment 1 much nearer to VII<sup>c</sup> than to VIII. 15
15. Spinneret shorter and broader, the length equal to approximately three times the median width-----*Zanclognatha*  
Spinneret longer and more slender, the length equal to 4 or 5 times the median width-----*Chytolita*
16. Anterior abdominal spiracles large, twice as high as wide. Insertion of seta IV on prothorax below the line of the center of the spiracle (pl. 9, C). Dorsal setigerous tubercles nearly flat, their setae very strongly clavate or balloon-shaped (pl. 7, I), II no longer than the width of its tubercle. 17  
*Bicptina*  
Anterior abdominal spiracles small, less than twice as high as wide. Insertion of seta IV on prothorax above the line of the center of the spiracle (pl. 9, D). Dorsal setigerous tubercles distinctly elevated, their setae rarely more than slightly enlarged at tip, II usually twice as long as the width of its tubercle (pl. 7, E, H)
17. Prespiracular shield elongate, wedge-shaped, very narrowly separated from or connate with the cervical shield. Spiracles strongly emarginate at ends. Head without pigment reticulation, the granules arranged in a reticulate pattern dorsally, enclosing pits-----*Kenia*  
Prespiracular shield rounded, well separated from the cervical shield. Spiracles but very slightly emarginate at ends. Head with pigment reticulation, the granules not arranged in a reticulate pattern and not enclosing pits. *Tetanolita*

## LITOPROSOPIS Grt.

## LITOPROSOPUS FUTILIS (G. &amp; R.)

Head 4.2 mm. broad. Body about 38 mm. long and 6 mm. broad at middle, abdominal segments of about equal width to 8; skin bearing small, isolated spine-like granules; general dorsal color apparently reddish brown.

A geminate pale middorsal line including and bordered broadly by reddish brown and with transverse white lines and spots between setigerous tubercles I and II. Traces of broad, broken pale longitudinal lines between I and II, and ventrad of II. A broad pale band with the spiracles well within it. The reddish brown dorsal coloration encroaches upon this pale band posterior to the spiracles where but a narrow margin of white remains. Supraspiracular area reddish brown reticulate with white. Spiracles entirely black. Venter of dorsal color becoming more dilute midventrally. Cervical shield large, brown, polished, the setigerous tubercles not elevated. Setigerous tubercles dark, II and III in particular being strongly conical, II about four times as large as I, III at least five times as large as IV, I and II very unusually close together being not more than the width of I apart; setae black, pointed at tip and extremely long the seta on III being decidedly longer than an abdominal segment. Head uniform brown or black except for an oblique pale line posterior to ocellus I, strongly transversely rugulose but not granulose. Ocelli I and II are peculiar in that their interspace is greater than that of ocelli II and III.

Described from one inflated larva in the U. S. National Museum collection labeled "Astoria Fla., Saw Palmetto, No. 9261, H. G. Dyar coll." Dr. Dyar was not certain that this larva was *futilis* but stated that *futilis* fed upon Saw Palmetto.

*Distribution.*—Georgia and Florida.

*Food plant.*—Probably dead leaf bases of cabbage palmetto (*Sabal palmetto*).

## PHYROSOPIS Grt.

(SUDARIOPHORA Zell.)

## PHYROSOPIS CALLITRICHOIDES Grt.

(SUDARIOPHORA ACUTALIS Wlk.)

Head 2.8 mm. broad. Body about 25 mm. long and 3.5 mm. broad at middle, tapering somewhat posteriorly; with a small middorsal hump on abdominal segment 1, a whiplike middorsal appendage twice as long as the segment on 2, a similar but much shorter middorsal appendage on 3 and a decided middorsal hump on 8; head and body set closely with short secondary hairs; general color probably brown with a conspicuous pale lateral stripe.

Body dark brown both dorsally and ventrally, tinged somewhat with pink, with a longitudinal pale area laterally, developed anteriorly where it covers most of the thorax and much of the venter of abdominal segment 1, or indefinite anteriorly and prominent from abdominal segment 4 posteriorly, encircling a large dark spot postero-ventral of the spiracle on 4, extending broadly across the spiracle and proleg on 5 and 6, partially crossing the spiracle on 7 as an oblique line directed dorsad and expanded to cover the dorsum on 8. Spiracles brown. Head brown, front, adfrontal areas and a line arising above antennal insertion and extending to posterior margin of head, white; mandible with about 10 teeth on cutting margin.

Described from 2 alcoholic and 1 inflated larva in U. S. National Museum labeled, respectively, "New Haven, Conn., Nov. 1901, A. H. Verrill coll." and "Bull. Is., N. C., *Smilax* sp., 11 Aug, 44, Lot 44-20792, s. s. 18276, Gordon No. 842."

*Distribution.*—New Hampshire, New York, New Jersey, Maryland, Illinois, North Carolina, Georgia, Florida, Alabama, Mississippi, and Texas.

*Food plant.*—Greenbrier (*Smilax*).

## METALECTRA Hbn.

Setigerous tubercles I<sup>a</sup> and I<sup>b</sup> confluent on mesothorax and metathorax. Head bearing sparse subconical granules on occiput..... *tantillus*  
Setigerous tubercles I<sup>a</sup> and I<sup>b</sup> separate on mesothorax and metathorax. Head bearing slightly elevated, convex granules on occiput..... *quadrisingnata*

## METALECTRA TANTILLUS (Grt.)

Head 1.4 mm. broad. Body about 19 mm. long and 3 mm. broad at middle, broadening somewhat posteriorly; skin minutely granulose; general color brown.

Coloration composed of a mixture of infuscated brown and reddish flecks, paler midventrally, unless otherwise indicated. A geminate pale middorsal line including blackish spots anterior to setigerous tubercle I, between I and II and posterior to II. Similar spots ventrad of I and II. Spiracles pale or brownish. Setigerous tubercles conspicuously prominent, broadly bell-shaped, I reddish brown, II pale; their setae rather stout, half as long as an abdominal segment and pointed at tip. Head closely reticulate with dark brown, without definite submedian arcs.

Described from one inflated larva in U. S. National Museum labeled "Under a log. July 22."

*Distribution.*—Pennsylvania, New Jersey, Virginia, North Carolina, Georgia, Florida, Mississippi, Louisiana, and Texas.

*Food.*—Immature larvae similar to the above have been taken feeding on fungus in damp piles of driftwood in Tennessee.

## METALECTRA QUADRISIGNATA (Wlk.)

Head 1.6 mm. broad. Body about 18 mm. long and 3 mm. broad at middle, broadening somewhat posteriorly; skin minutely granulose; general color indeterminable.

Body marked with blackish which is especially conspicuous anteriorly on abdominal segments between setigerous tubercles I and III. Spiracles pale or brownish. Setigerous tubercles but moderately large, broadly bell-shaped, decidedly elevated, I and II apparently of the same color; their setae rather stout, half as long as an abdominal segment, pointed at tip. Anal shield produced and upturned medially on posterior margin forming a short, blunt horn. Head pale, the blackish reticulation tending to form dark blotches.

Described from 1 mature and 2 immature alcoholic larvae collected at Concordville, Pa., September 17, 1928, in a mushroom house, by C. A. Thomas.

*Distribution*.—United States: Maine, New York, Massachusetts, New Jersey, Pennsylvania, Maryland, Ohio, Illinois, Iowa, Kentucky, Tennessee, North Carolina, Georgia, Florida, and Texas. Canada: Nova Scotia, Quebec, and Ontario.

*Food*.—Cultivated mushrooms.

## SACCHAROPHAGOS Schaus

(GABARA Wlk., in part)

## SACCHAROPHAGOS MOCHISA Schaus

Head 3 mm. broad. Body about 30 mm. long and 5 mm. broad at middle, abdominal segments of about equal width throughout; skin bearing small rounded granules; general color pale, without markings.

Setigerous tubercles large, black or brown, rather flat, their setae very long, stout, pointed at tip. Prolegs absent on abdominal segment 3. Spiracles black. Head brown flecked with small dark spots.

Described from two alcoholic larvae in U. S. National Museum labeled "In cane, February 1923, *Los Mochis*, Sinaloa, Mexico. R. H. Van Zwaluwenburg coll."

*Distribution*.—Mexico.

*Food*.—Zwaluwenburg states the larvae often gnaw a rough cavity at base of stalks of sugar cane and are sometimes found feeding on trash about the sprouted eyes several feet above ground.

## SCOLECOCAMPA Gn.

SCOLECOCAMPA LIBURNA (Geyer)

Head 3.1 mm. broad. Body about 35 mm. long and 4 mm. broad at middle, abdominal segments of about equal width to 8; skin transparent, bearing small obscure rounded granules; general color whitish, without markings.

Cervical shield blackish, transversely oblong, extending laterally almost to the spiracle. Anal shield blackish. Legs black. Crochets on prolegs very long and slender. Spiracles small, black. Setigerous tubercles large, somewhat elevated, black. Head deep uniform black, bearing obscure coarse granules dorsally.

Described from 20 larvae collected at Magnolia, Tenn., September 14, 1920. Moths were determined by Dyar.

*Distribution*.—New York, Pennsylvania, Illinois, Missouri, Tennessee, North Carolina, Georgia, Florida, Mississippi, and Texas.

*Food*.—Decaying logs and stumps of oak, sycamore, and other trees.

## ARUGISA Wlk.

(DIALLAGMA Sm.)

## ARUGISA LATIORELLA (Wlk.)

Head 1.4 mm. broad. Body about 16 mm. long and 2 mm. broad at middle, broadened decidedly on metathorax and abdominal segment 1 and tapering posteriorly; skin bearing small rounded granules; general color rather dark.

Dorsum to just ventrad of setigerous tubercle II dark tinged with dull reddish, bordered laterally by a pale line. A narrow, dark middorsal stripe. From ventrad of II to and including the spiracles abruptly much paler, flecked and streaked with reddish brown and darker in the line of the spiracles. Spiracles black. Body a decided light brown from the spiracles to setigerous tubercle VI, remainder of venter dark with a brown midventral stripe. Setigerous tubercles rather large and distinctly elevated, subcylindrical on abdominal segments posterior to 3 on which II is distinctly larger than I, II prostrate on 8 and 9; setae blunt, tending to arise from the posterior face of their tubercles, except II on abdominal segment 8, and no longer than the width of their tubercles. Head white, front black medially and laterally, a strong, straight, black stripe from A' posteriorly and dark reticulation posterior to the ocelli and on posterior margin of head.

Described from six larvae collected at Clarksville, Tenn., April 27, 1927. Moths emerged May 24, and were determined by McDunnough.

*Distribution.*—Virginia, North Carolina, Tennessee, Georgia, Florida, Alabama, and Texas.

*Food.*—The larva is found in clumps of bluegrass (*Poa pratensis*), where it feeds upon both the dead and the live grass.

## EPIZEUXIS Hbn.

1. Setigerous tubercles I and II very strongly elevated and subcylindrical, higher than their basal width, at least on posterior abdominal segments. Tubercles II on abdominal segment 8 closer together than tubercles I. Surface of cervical shield irregular. All tarsal setae slender, pointed.----- 2
 

Setigerous tubercles I and II not very strongly elevated, flat or conical, basal width greater than the height. Setigerous tubercles II on abdominal segment 8 farther apart than setigerous tubercles I. Surface of cervical shield almost regular. Form of tarsal setae various.----- 3
2. Prolegs on abdominal segment 3 nonfunctional knobs, without crochets. Labial palpus as long as spinneret. Setigerous tubercles II and III directed anteriorly on anterior abdominal segments. Widely distributed.----- *lubricalis*

Prolegs functional on abdominal segment 3. Labial palpus about one-fourth as long as the spinneret. Setigerous tubercles II and III not directed anteriorly on anterior abdominal segments. Reported from Florida only *gopheri*
3. Setigerous tubercle O' more than twice the width of ocellus I removed therefrom. Spiracle with narrow rim.----- 4
 

Setigerous tubercle O' but little more than width of ocellus I removed therefrom. Spiracles with broader rim.----- 5
4. Prolegs present on abdominal segment 3. Crochets on prolegs short. Median line of head above apex of front very nearly equal to twice height of front. Head with distinct pigment reticulation. Spiracles broad.----- *acnula*

Prolegs absent on abdominal segment 3. Crochets on prolegs long. Median line of head above apex of front equal to one and one-half times height of front. Head without pigment reticulation. Spiracles extremely narrow, slitlike.----- *americalis*
5. Skin obscurely granulose. Prolegs without crochets on abdominal segment 3. Tarsi long, the apical setae slender, pointed. Papilla on basal segment of labial palpus dome-shaped (a unique character) (pl. 10, A). Thorax and anterior abdominal segments not lobed ventro-laterally.----- *rotundalis*

- Skin pubescent or hairy. Prolegs with crochets on abdominal segment 3. Tarsi short, the inner apical setae spatulate or fan-shaped (pl. 9, H, J). Papilla on basal segment of labial palpus a slender cone (pl. 10, C). Thorax and anterior abdominal segments lobed ventro-laterally, the segmental incisure deep----- 6
6. Body broadened on metathorax and anterior abdominal segments. Skin bearing minute pubescence. Dorsal setae on abdomen pointed, prostrate. Head without pigment reticulation----- *forbesi*
- Body not broadened on metathorax and anterior abdominal segments. Skin bearing coarse, barbed pubescence one-half as long as the setae. Dorsal setae of abdomen capitate, erect. Head with pigment reticulation-- *julia*

## EPIZEUXIS LUBRICALIS Geyer

Head 1.5 mm. broad. Body about 19 mm. long and 3 mm. broad at middle, abdominal segments of about equal width throughout; skin closely covered with black rugae; general color blackish, without markings. All setigerous tubercles above the line of the prolegs large, covered with scalelike granules, I and II remarkable subcylindrical appendages, III similar but much smaller, I dark, II yellowish; their setae stout, slightly clavate, blunt and short, I and II both directed anteriorly on first six abdominal segments, I anteriorly and II posteriorly on segment 7 and both posteriorly on the remaining segments, III oriented the same as I. Spiracles black. Head uniform black, seta A' and those below the ocelli pointed at tip, the remainder as on the body, with close elevated rounded black granules.

Described from many live larvae collected in October, April, and May at Clarksville, Tenn. Moths determined by H. G. Dyar.

*Distribution.*—United States: Maine, New York, Connecticut, Pennsylvania, Maryland, North Carolina, Georgia, Florida, Mississippi, Tennessee, Illinois, Minnesota, Montana, Nebraska, Kansas, Colorado, Arizona, New Mexico, and Texas. Canada: Nova Scotia, Alberta, and British Columbia.

*Food.*—Always found associated with rotten wood but whether the larvae feed upon wood or upon fungi associated with it is not known. Larvae have been taken feeding on fungi. They also feed to some extent upon green plants, in captivity.

## EPIZEUXIS GOPHERI Sm.

Head 2.1 mm. broad. Body about 21 mm. long and 3 mm. broad at middle, broadest through abdominal segments 3, 4, and 5; skin set closely with coarse, abruptly elevated, corrugated granules which are higher than wide and circular in cross section; general color apparently dusky brown, without markings. Setigerous tubercles of body prominent, subconical except I and II which are strongly elevated and subcylindrical; their setae stout, corrugated, blunt at tip and about one-fourth as long as an abdominal segment. Setigerous tubercle VII\* absent on abdominal segments 1 and 2. Each proleg on all abdominal segments with but three or four crochets of very unequal length and but slightly curved. The two ventral setae on shield of proleg bifid from the base. Claw on leg extremely long and slender. Spinneret extremely long and slender, about four times as long as the labial palpus. Color of spiracle indeterminate. Head brown, set closely with very small rounded granules, the setae as on the body excepting A', F' and those ventrad of the ocelli which are pointed at the tip, tubercles rather strongly elevated.

Described from one alcoholic larva in the U. S. National Museum collection labeled "Florida (Altamont). From nest of burrowing turtle. No. 5921." This specimen is not named in the museum collection but from the statements of Smith and Hubbard it seems reasonably certain that it is *gopheri*. The specimen may have been collected at Crescent City, Fla.

*Distribution.*—Florida.

*Food.*—Fresh excrement of the gopher turtle (*Gopherus polyphemus*), the larva spending its life far under ground in the burrow of this tortoise.

**EPIZEUXIS AEMULA Hbn.**

Head 1.4 mm. broad. Body about 19 mm. long and 2.6 mm. broad, broadening gradually from prothorax to abdominal segment 8; skin set very closely with small rounded granules; general color varying from a moderately dark gray tinged with pinkish to a rosy pink throughout. A distinct dusky middorsal stripe. No other markings, except an indefinite dusky shade subdorsally. Spiracles brownish with black rims. Setigerous tubercles small, but slightly elevated, dark; their setae pale, about twice as long as the width of the tubercles, stout, blunt apically, I directed anteriorly and II posteriorly on the abdomen. Head brownish closely reticulate with fuscous, submedian arcs present dorsally.

Described from four live larvae collected during April at Clarksville, Tenn. Moths emerged in May and were determined by Dyar.

*Distribution.*—United States: Maine, New York, Connecticut, Pennsylvania, Maryland, Virginia, North Carolina, Tennessee, Mississippi, Missouri, Minnesota, Texas, New Mexico, Colorado, Utah, and Montana. Canada: Alberta and British Columbia.

*Food.*—Our specimens of this larva were reared on dead leaves. They also have been reported as injurious to corn fodder in Mississippi and have been beaten from spruce where the larvae probably were feeding in a webbed-up mass of the dead needles.

**EPIZEUXIS AMERICALLIS (Gn.)**

Head 1.3 mm. broad. Body about 18 mm. long and 2 mm. broad at middle, broadening gradually to abdominal segment 7; skin almost unpigmented, with small, isolated, rounded granules among which larger rounded granules are scattered; general color a dull, uniform gray sometimes faintly suffused with pinkish, venter sordid gray. No markings. Setigerous tubercles of body large, somewhat elevated, their setae yellow and tapering toward the tip which is somewhat enlarged, I and II about one-third as long as an abdominal segment, I directed somewhat anteriorly and II somewhat posteriorly. Spiracles dark. Head brown, without markings, set closely with small infuscated, rounded granules.

Described from a large number of live larvae collected during April at Puyallup, Wash. These larvae are abundant in the mounds of an ant, *Formica rufa*, a medium-sized mound probably containing several hundred of them. When the mound is disturbed the ants swarm out very pugnaciously but either ignore these larvae when they are encountered or seize them and carry them into the nest as is done with the young of the ant. Moths emerged in April and May and were determined by Heinrich.

*Distribution.*—United States: Maine, New York, Connecticut, Pennsylvania, Maryland, North Carolina, Georgia, Florida, Minnesota, Nebraska, Missouri, Texas, New Mexico, Montana, and Washington. Canada: British Columbia and Alberta.

*Food.*—Materials of the ant mound including needles of Douglas-fir, bark of twigs of Douglas-fir and dead leaves of various kinds. In confinement the larvae consume a remarkably large amount of this debris.

**EPIZEUXIS ROTUNDALIS (Wlk.)**

Head 1.8 mm. broad. Body about 22 mm. long and 2.5 mm. broad at middle, broadening very gradually from the prothorax to abdominal segment 8; skin unpigmented, translucent, set closely with small, colorless, isolated, slightly elevated granules; general color varying from pale gray to dusky gray depending upon the color of the contents of the alimentary canal. No markings. Prolegs on third abdominal segment distinct but without crochets. Spiracles entirely black. Setigerous tubercles pale fuscous, slightly but distinctly elevated, their setae pale brown, coarse, of nearly uniform diameter throughout but faintly enlarged at tip, I directed slightly anteriorly and II posteriorly on the abdomen. Cervical shield dark fuscous. Head uniform black, without markings, set closely with very fine rounded granules.

Described from many live larvae collected in February and March at Clarksville, Tenn. Moths emerged in April and May and were determined by Carl Heinrich.

*Distribution.*—Maine, New Hampshire, New York, Pennsylvania, Maryland, Virginia, North Carolina, Tennessee, Florida, Texas, Kansas, Missouri, and Illinois.

*Food.*—This larva lives in the humus beneath leaves in the woods and apparently pupates in such situations without forming a cocoon. It has been taken feeding on dead coral fungus and on dead leaves and has been reared on dead leaves.

**EPIZEUXIS FORBESI (French)**

Head 1.1 mm. broad. Body about 12 mm. long and 1.6 mm. broad at middle, broadened on meso- and meta-thorax and upon abdominal segments 7 and 8; skin set very closely with minute, very short pubescence; general color nearly black, the dorsum sometimes paler. The body may be unicolorous except that the venter is less dark than other parts or the dorsum to well ventrad of setigerous tubercle II may be of a sharply defined paler shade with a dusky mid-dorsal line. Spiracles brownish, narrow, the inner margin of rim strongly elevated. Setigerous tubercles small, not strongly elevated, fuscous; their setae white, weak, curved, decumbent, rather long, pointed at the tip, I on the abdomen directed antero-dorsally and II postero-dorsally. Head brown, without markings, set closely with coarse, distinctly conical, dark granules.

Described from seven live larvae collected during March at Clarksville, Tenn. A moth emerged in April, and was determined by Carl Heinrich.

*Distribution.*—New York to Illinois and Tennessee.

*Food.*—Dead leaves.

**EPIZEUXIS JULIA (B. and McD.)**

Head 1.5 mm. broad. Body about 14 mm. long and 3 mm. broad at middle, distinctly broadest through the metathorax and abdominal segments 1 and 2 and on 7 and 8; skin set closely with very minute granules which bear rather coarse dark barbed hairs about one-half as long as the primary setae and, in addition, the skin is clothed with an exceedingly fine short pubescence; general color a rather dark gray. No markings except a dark middorsal stripe. Setigerous tubercles of body moderately large, the central portion elevated, subconical; their setae slender, somewhat enlarged at tip, two or more times as long as the breadth of their tubercles, I on the abdomen directed somewhat anteriorly and II posteriorly. Tubercles on cervical shield strongly elevated. Spiracles, including rims, brown. Head pale brownish with close dark reticulation, submedian arcs distinct on occiput only, an unmarked area above the base of the antenna, granules rather coarse, rounded.

Described from eight live larvae collected during March, April, and May at Clarksville, Tenn. A moth emerged May 18, and was determined by Carl Heinrich.

*Distribution.*—New York and Tennessee.

*Food.*—Bark of fine dead twigs which are in early stages of decay and perhaps dead leaves also.

### PHALAEENOPHANA Grt.

#### PHALAEENOPHANA PYRAMUSALIS (Wlk.)

Head 1.3 mm. broad. Body about 16 mm. long and 2.4 mm. broad at middle, abdominal segment 7 somewhat broader than 6 and 8; skin bearing close, coarse, isolated granules tending to be arranged in transverse lines; general color dark gray or dull black.

Throughout is an undercolor of obscure green suffused and spotted rather than reticulate with infuscated red, interspersed with pale flecks formed by coarse pale granules. Middorsal pale line absent. Coloration intensified on anterior half of abdominal segments in a dark spot between setigerous tubercles I and forming a continuous middorsal stripe on abdominal segments 7, 8, and 9 where it is bordered laterally by a conspicuous, curved, pale mark beginning narrowly between III and the spiracle on segment 7, including II of this segment and I and II of the following segments. On each abdominal segment an infuscated red mark arising ventrad of IV and broadening obliquely upward ventrad of III to the anterior margin of the segment where the mark fuses with the general coloration. Spiracles small, entirely black, set in small pale areas. Traces of a band of yellowish flecks ventrad of the spiracles. Red less infuscated and green more evident ventrally. Setigerous tubercles in general black with pale apices and set in pale circles, I black at least on dorsal margin with the apex white, II white with the dorsal margin dusky, setae infuscated at base and paler apically, at least twice as long as the width of their tubercles and tapering to a blunt tip (pl. 7, F). Head pale greenish, submedian arcs indicated anteriorly and on the occiput, a narrow unmarked area above the base of the antennae to A<sup>2</sup>, adfrontal areas black, remainder of head closely reticulate with black.

Described from 15 live larvae collected in October at Clarksville, Tenn. Moths emerged indoors in February and March, and were determined by Dyar.

*Distribution.*—Maine, New York, Pennsylvania, District of Columbia, North Carolina, Tennessee, Missouri, Georgia, and Texas.

*Food plant.*—Larvae are found in cool, moist situations such as are preferred by jewelweed (*Impatiens*) where they feed on forest leaves black with decay.

### PALTHIS Hbn.

Coarse, elevated granules on the skin conical, blunt apically. Cervical shield with but a few coarse granules..... *angulalis*

Coarse elevated granules slender, spinelike, acutely pointed apically (pl. 8, B).

Cervical shield closely, coarsely granulose..... *asopialis*

### PALTHIS ANGULALIS Hbn.

Head 1.7 mm. broad. Body about 22 mm. long and 3 mm. broad at middle, tapering posteriorly with a decided dorsal hump on abdominal segment 8; skin bearing subconical coarse granules; general color dusky brown tinged with pinkish.

Coloration made up of a dusky reddish reticulation, the interstices yellow. A dark middorsal line and a segmental series of small, dark, shield-shaped dorsal markings including setigerous tubercles I and II, more evident on anterior ab-

dominal segments. Spiracles black with the extreme center pale. Subventral pale-stripe absent. A yellow line arising between III and the spiracle on 7 and extending obliquely dorsad of II on 8. Dorsum of 8 pale laterally owing to concentration of the yellow ground color. Setigerous tubercles rather large, elevated. Head brown, with small rounded granules, without submedian arcs except on occiput, reticulate with black.

Described from four larvae collected near Puyallup, Wash., in September by W. W. Baker and the writer.

*Distribution.*—United States: Washington, Minnesota, New York, Maine, Pennsylvania, Maryland, North Carolina, Tennessee, Missouri, Georgia, and Texas. Canada: British Columbia, Alberta, and Manitoba.

*Food.*—Serviceberry (*Amelanchier*), blackberry, and alder.

#### PALTHIS ASOPIALIS (Gr.)

Head 1.6 mm. broad. Body about 20 mm. long and 3 mm. broad at middle, tapering posteriorly with a distinct dorsal hump on abdominal segment 8; skin bearing slender spinelike granules; general color indeterminable.

A larva collected near Clarksville, Tenn., October 3, 1927, pupated before it could be described and produced a moth October 23, 1927, which was determined by Dyar. A badly discolored alcoholic larva collected at Moss Bluff, Tex., in October 1924 by K. B. McKinney is in our collection.

*Distribution.*—Minnesota, New York, Pennsylvania, Maryland, Ohio, North Carolina, Tennessee, Georgia, Florida, Mississippi, Louisiana, and Texas.

*Food.*—Coralberry (*Symphoricarpos orbiculatis*).

#### LASCORIA Wlk.

##### LASCORIA AMBIGUALIS (Wlk.)

Head 1.6 mm. broad. Body about 13 mm. long and 2 mm. broad at middle, broadest on anterior abdominal segments and tapering distinctly posteriorly, with a slight middorsal hump on 8; skin bearing minute rounded granules; general color dark.

Body ground color, pale, reticulate throughout with blackish, somewhat paler and tinged with dull red ventrad of the spiracles. Middorsal pale line evident on anterior abdominal segments as a large V-shaped pale mark at posterior margin of segments but strong and continuous posteriorly. Indefinite pale areas at juncture of segments in the line of the spiracles and dorsad of II. No other markings. Setigerous tubercles black, round in outline, but slightly elevated except II on 8 which is conspicuously large, bluntly subconical and strongly elevated. The setigerous tubercles are peculiar in that each bears an apical brown subsidiary tubercle bearing the seta. Spiracles extremely narrow, blackish brown. Head white, faintly tinged with green, an unmarked area medial of the ocelli, otherwise closely reticulate with black, front white with two black vertical stripes.

Described from two larvae collected at Washington, D. C., November 18, 1931, on cultivated *Chrysanthemum* by J. U. Gilmore. A moth emerged indoors January 10, 1932, and was determined by Benjamin.

*Distribution.*—New York, Pennsylvania, District of Columbia, North Carolina, Georgia, Florida, and Texas.

*Food plant.*—Cultivated *Chrysanthemum*.

## PHILOMETRA Grt.

## PHILOMETRA METONALIS (Wlk.)

Head 1.2 mm. broad. Body about 20 mm. long and 2.4 mm. broad at middle, very slightly broadened on metathorax and abdominal segments 7 and 8; skin bearing an irregular mixture of fine and coarse, subconical granules; general color dark gray.

Dorsum sordid pale to just ventrad of setigerous tubercle II with a prominent dark middorsal stripe and sparse, transverse reddish fuscous markings midway between I and II. From ventrad of II to and partially including the spiracles, blackish tinged with reddish, darker ventrally. Spiracles black. Abruptly much paler ventrad of the spiracles to VI and marked with reddish which tends to form oblique stripes posteriorly. Venter ventrad of the spiracles to VI and marked with reddish which tends to form oblique stripes posteriorly. Venter ventrad of VI blackish, as dark as the supraspiracular area, with a dull red midventral line. Setigerous tubercles of body strongly elevated, dark, their setae set rather on the posterior face of the tubercles, stout, pointed at tip, at least twice as long as the width of their tubercles, I and II supine, directed posteriorly almost parallel with the dorsum (pl. 7, B). Head pale, closely reticulate with dilute black.

Described from 4 larvae: 2 collected at Clarksville, Tenn., in April, and 2 collected near Lexington, Ky., in May. Moths emerged from early in May to early in June, and were determined by Dyar.

*Distribution.*—Nova Scotia, Maine, New York, Pennsylvania, Virginia, Kentucky, and Tennessee.

*Food.*—Dead bluegrass (*Poa pratense*) and dead leaves of deciduous trees.

## PHALAEENOSTOLA Grt.

## PHALAEENOSTOLA LARENTIOIDES Grt.

Head 1.2 mm. broad. Body about 15 mm. long and 2 mm. broad at middle, tapering posteriorly; skin bearing small, isolated, rounded granules interspersed with coarse, corrugated, subconical granules; general color brownish gray.

A strongly marked dark middorsal stripe. Body dorsad of the spiracles with many pale flecks which are not arranged in lines. A red stripe just ventrad of setigerous tubercle II, another dorsad of III. Ventrad of III to and including the spiracles more infuscated, especially posteriorly and reticulate with red. Spiracles entirely black. Traces of a pale subventral stripe bordered ventrally anteriorly by a red line and bearing oblique red stripes posteriorly. Setigerous tubercles distinctly elevated, setae rather stout, pointed at tip, somewhat more than the width of their tubercles in length. Head white reticulate with dilute black, adfrontal areas dilute black.

Described from 11 live larvae collected during April at Clarksville, Tenn. Moths determined by H. G. Dyar.

*Distribution.*—New York, Ohio, Indiana, Tennessee, Missouri, and Kansas.

*Food.*—Larvae taken in clumps of bluegrass (*Poa pratense*) and among weed litter. Feed upon both live and dead bluegrass, dead forest leaves, and live clover.

## HORMISA Wlk.

## HORMISA LITOPHORA (Grt.)

Head 1.6 mm. broad. Body about 20 mm. long and 2.2 mm. broad at middle tapering posteriorly; skin bearing large, upright, subcylindrical granules in pale areas and smaller convex granules in dark areas; general color gray, matching dead, weathered bluegrass.

A distinct but not very prominent dark middorsal stripe bordered laterally by aggregations of pale flecks. A pale line of flecks ventrad of setigerous tubercle I, and a broader one ventrad of II, both much stronger posteriorly. All of these pale lines alternating with obscure red lines. Supraspiracular area infuscated, somewhat paler ventrally and more strongly pigmented posteriorly. Spiracles entirely black. A pale subspiracular stripe bordered ventrally anteriorly by a reddish stripe and bearing oblique reddish stripes posteriorly. A broken dusky reddish midventral stripe on abdominal segments 1 and 2. Setigerous tubercles nearly flat, black, their setae small (pl. 7, C). Head white with the ad-frontal areas, two straight reticulate stripes above the front, a reticulate stripe between A<sup>2</sup> and A<sup>3</sup> and extending to the posterior margin, and a reticulate stripe posterior to the ocelli, dilute black.

Described from four live larvae collected during April at Clarksville, Tenn. Moths emerged early in May, and were determined by Dyar.

*Distribution*.—New York and Connecticut to Tennessee.

*Food*.—Both live and dead bluegrass (*Poa pratense*), and also green clover.

### ZANCLOGNATHA Lcd.

1. A dark middorsal stripe present..... 2  
Dark middorsal stripe absent. Reticulation on body bright red..... 4
2. Pigment reticulation of body blackish or dull reddish. Spiracles deep brown or black. Without a segmental series of curved yellow lines subdorsal anteriorly on each segment and extending between setigerous tubercles I and II posteriorly..... 3  
Pigment reticulation of body bright red. Spiracles pale brown. With a segmental series of curved yellow lines on the abdomen, subdorsal anteriorly on each segment and extending between I and II posteriorly— *jacchusalis*
3. Pigment reticulation of body blackish. With conspicuously coarser granules in the interstices of the reticulation..... *pedipalpis*  
Pigment reticulation of body dull reddish. Without coarser pale granules in the interstices of the reticulation..... *lituralis*
4. Setigerous tubercles small, inconspicuous, dark brown; the transverse diameter of I on abdominal segment 1 equal to one-sixth the space between tubercles I on this segment (3:18). Spiracles dark brown..... *thermalis*  
Setigerous tubercles larger, black; transverse diameter of I on abdominal segment 1 equal to approximately one-third the space between tubercles I on this segment, or more. Spiracles pale brown..... 5
5. Setigerous tubercle I on abdominal segment 1 much larger than II. With a pale spot dorsad of II throughout and posterior to III on abdominal segment 7..... *cruralis*  
Setigerous tubercles I and II on abdominal segment 1 of equal size. Without a pale spot dorsad of II or posterior to III..... *obscuripennis*

### ZANCLOGNATHA JACCHUSALIS (Wlk.)

Head 1.7 mm. broad. Body about 16 mm. long and 3.2 mm. broad at middle, slightly broadened on abdominal segment 8; skin pavement granulose; general color pale, indefinite brownish gray.

Coloration composed of a sparse bright red reticulation on a dull yellow ground. A broad, broken, dark red middorsal line. A segmental series of distinct, curved yellow lines, subdorsal anteriorly on the segments and extending between setigerous tubercles I and II posteriorly. Spiracles pale brown. Setigerous tubercles small, black, I on abdominal segment 1 twice as large as II, their setae short, pointed; I enclosed with red outlining a yellow spot including the tubercle. Head brown, coarsely granulose, with black reticulation.

Described from 25 larvae collected near Orting, Wash., in April and May. Moths emerged in July and August, and were determined by Clarke.

*Distribution.*—United States: Maine, New York, Connecticut, New Jersey, Pennsylvania, Wisconsin, North Carolina, Tennessee, Alabama, Louisiana, Texas, and Washington. Canada: British Columbia.

*Food.*—Dead cottonwood leaves.

#### ZANCLOGNATHA PEDIPALIS (Gn.)

Head 1.8 mm. broad. Body about 16 mm. long and 3.5 mm. broad at middle, slightly broadened on thorax and abdominal segments 7 and 8; skin finely pavement granulose; general color sordid brownish.

Coloration composed of an infuscated brown reticulation on a yellowish ground, the interstices in the reticulation occupied by one or more large, pale granules. Middorsal stripe nearly black, bordered laterally by indefinite pale stripes with setigerous tubercle I at center, composed of coarse, pale granules. A dark dash from each abdominal spiracle directed upward and forward to slightly beyond the margin of the preceding segment. An indefinite pale spot dorsad of setigerous tubercle I throughout and posterior to III on abdominal segment 7. Spiracles deep brown or black. Midventral reticulation bright red. Setigerous tubercles moderately large, dark, their setae no longer than width of tubercle, pale, pointed apically. Head bearing small, contiguous, rounded granules, pale with blackish reticulation.

Described from 11 live larvae collected near Clarksville, Tenn., in April and October. A larva which spun up for pupation April 8, 1925, produced a moth April 26, 1925, which was determined by Dyar and by Benjamin.

*Distribution.*—Maine, New York, Pennsylvania, Maryland, Virginia, Tennessee, and Missouri.

*Food.*—Dead leaves of deciduous trees.

#### ZANCLOGNATHA LITURALIS (Hbn.)

Head 1.5 mm. broad. Body about 17 mm. long and 3 mm. broad, slightly broadened on thorax and abdominal segments 7 and 8; skin bearing close, fine granules; general color dusky brownish or dusky purplish red.

Coloration composed of dull red reticulation on a pale or yellow ground. A dusky middorsal stripe, more evident on anterior half of abdominal segments. A round, definite pale area surrounding setigerous tubercle I, a pale area dorsad of II throughout, and another posterior to III on abdominal segment 7. Spiracles black. Setigerous tubercles moderately large, dilute black, their setae pointed and scarcely longer than the width of their tubercles. Head pale reticulate with infuscated brownish.

Described from three larvae collected at Clarksville, Tenn., in February. Moths emerged in March and April, and were determined by Benjamin.

*Distribution.*—Maine, New Hampshire, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, West Virginia, Virginia, Tennessee, North Carolina, Georgia, Florida, and Texas.

*Food.*—Dead leaves of trees.

#### ZANCLOGNATHA THERALIS (Wlk.)

Head 1.6 mm. broad. Body about 17 mm. long and 2.5 mm. broad at middle, broadened on thorax and abdominal segments 7 and 8; skin bearing small, slightly convex, contiguous granules; general color brownish.

Coloration of body composed of bright red reticulation on a yellow ground. No dark middorsal line. Setigerous tubercles I and III in yellow spots, small yellow spot dorsad of II, an oblique red line, extending the length of each abdominal segment between II and III. Spiracles dark brown. Setigerous tubercles small, inconspicuous, brown; II smaller than I, transverse width of I on abdominal

segment 1 equal to approximately one-sixth the space between tubercles I on this segment (3:18). Head with small contiguous granules, brown with brownish reticulation.

Described from four alcoholic larvae reared to maturity at Bar Harbor, Maine, by A. E. Brower. Larvae hatched August 2 were mature October 2, 1938.

*Distribution.*—United States: Maine, New Hampshire, New York, and North Carolina. Canada: Nova Scotia.

*Food.*—Probably dead leaves.

#### ZANCLOGNATHA CRURALIS (Gn.)

Head 2 mm. broad. Body about 16 mm. long and 3.5 mm. broad at middle, broadened on thorax and abdominal segments 7 and 8; skin bearing small, contiguous, rounded granules; general color pale leaf brown tinged with pink.

Body coloration composed throughout of a bright red reticulation on a yellowish brown ground. Dark middorsal line absent. An indefinite, sinuous pale line subdorsally. A pale spot dorsad of setigerous tubercle II throughout and posterior to III on abdominal segment 7. Spiracles pale brownish. Setigerous tubercles small, black, their setae no longer than width of tubercle and pointed apically. Head finely granulose, pale, closely reticulate with brownish red.

Described from 12 live larvae collected near Clarksville, Tenn., in February and March. Moths emerged in April, and were determined by Dyar.

*Distribution.*—United States: New York, Pennsylvania, Maryland, Illinois, Tennessee, North Carolina, and Georgia. Canada: Nova Scotia.

*Food.*—Dead leaves of deciduous trees.

#### ZANCLOGNATHA OBSCURIPENNIS (Grt.)

Head 2 mm. broad. Body about 13 mm. long and 2.5 mm. broad at middle, broadened on thorax and abdominal segments 7 and 8; skin bearing small granules; general color yellowish reticulate with bright red.

Coloration to base of prolegs composed of a bright red reticulation on a yellow ground. No middorsal dark stripe, this area occupied by red reticulation. No pale spots including setigerous tubercle I, dorsad of II or posterior to III on abdominal segment 7. Setigerous tubercles apparently black, II on 1 as large as I, the transverse diameter of I equal to approximately one-third the space between tubercles I on this segment (6:20). Spiracles pale or pale brown. Body setae very short, slender, pointed. Head bearing small, rounded, contiguous granules, coarsely reticulate with reddish brown.

Described from two inflated larvae in U. S. National Museum labeled "July 26, 1882, No. 2807."

*Distribution.*—New York, District of Columbia, North Carolina, and Alabama.

*Food plants.*—Probably dead leaves.

#### CHYTOLITA Grt.

##### CHYTOLITA MORBIDALIS (Gn.)

Head 2 mm. broad. Body about 16 mm. long and 3.5 mm. broad at middle, slightly broadened on thorax and abdominal segments 7 and 8; skin bearing small contiguous granules; general color pale leaf brown sometimes tinged with pink.

Coloration composed of a bright red or dull reddish reticulation on a yellow ground. A dark reddish middorsal stripe. A zigzag red line subdorsally extend-

ing upward between setigerous tubercles I and II almost to the line of II and downward near juncture of segments to the line of III. Spiracles black. Setigerous tubercles small, dark, I larger than II, in subcircular yellow spots throughout. Head pale or pale brown with close dark reddish or brownish red reticulation.

Described from many larvae collected near Clarksville, Tenn., in February, March, and October. The February larvae produced moths in April which were determined by Benjamin. A few larvae also have been taken in western Washington in April and May. A moth which emerged April 22, 1935, was determined by Clarke.

*Distribution.*—United States: Massachusetts, New York, Pennsylvania, Ohio, Maryland, Virginia, North Carolina, Tennessee, New Mexico, Colorado, Wyoming, Montana, and Washington. Canada: British Columbia and Nova Scotia.

*Food.*—Dead leaves of deciduous trees.

### BLEPTINA Gn.

1. Skin very minutely granulose, appearing smooth. Spiracles bright yellow. Dorsal setae of body yellow. Setigerous tubercles of body in reddish circles  
*inferior*  
Fine granules of skin interspersed with very coarse, corrugated, elevated pale granules. Spiracles dark flecked regularly with golden brown. No special markings about the setigerous tubercles..... 2
2. Ground color of head brown..... *caradrinalis*  
Ground color of head black..... *medialis*

### BLEPTINA INFERIOR Grt.

Head 1.9 mm. broad. Body about 15 mm. long and 3 mm. broad at middle, broadening from prothorax to abdominal segment 8 with 7 and 8 abruptly enlarged; skin bearing very minute granules, appearing smooth; general color black or dark infuscated brown.

A subdorsal stripe ventrad of setigerous tubercle II and circles about tubercles I to VI dull reddish. Venter dusky. No other markings. Spiracles bright, conspicuous yellow. Dorsal setae yellow. Head dull brownish with numerous dark depressions, bases of setae and margin of front dark. No other markings.

Described from 20 larvae collected near Clarksville, Tenn., in February. Moths emerged in April, and were determined by Benjamin.

*Distribution.*—North Carolina, Tennessee, Missouri, Texas, Georgia, and Florida.

*Food.*—Dead leaves of deciduous trees.

### BLEPTINA CARADRINALIS Gn.

Head 1.5 mm. broad. Body about 18 mm. long and 3.5 mm. broad at middle, gradually increasing in width from the prothorax posteriorly; skin bearing a mixture of fine and coarse granules; general color varying from nearly black to dark infuscated brown, the skin having a finely speckled appearance owing to the presence of coarse, pale granules.

The coloration may be nearly uniform throughout except a pale midventral stripe or there may be a dark middorsal stripe, four small, dorsal pale spots at posterior margin of abdominal segments, and a pale to reddish stripe dorsad of the spiracles. Setigerous tubercles broadly convex, nearly flat, their setae pale. Spiracles dark, their centres regularly flecked with golden brown. Head brown with close-set dark depressions, a pale stripe extending along the adfrontal areas, margin of front dark; the granules arranged in a reticulate pattern dorsally.

Described from numerous larvae collected near Clarksville, Tenn., and Puyallup, Wash., in February, March, and December. Moths emerged in March, and were determined by Benjamin.

*Distribution.*—United States: Washington, North Dakota, Minnesota, Maine, New Hampshire, New York, Maryland, Pennsylvania, Colorado, Kansas, Missouri, Arizona, New Mexico, Texas, Mississippi, Alabama, Tennessee, North Carolina, Georgia, and Florida. Canada: British Columbia.

*Food.*—Dead leaves of deciduous trees.

#### BLEPTINA MEDIALIS Sm.

Head 1.5 mm. broad. Body about 12 mm. long and 2.5 mm. broad at middle, increasing in width from prothorax to abdominal segment 8, with 7 and 8 distinctly broader; skin obscurely rugulose and bearing coarse, corrugated pale granules; general color black both dorsally and ventrally.

With four dorsal pale spots at juncture of abdominal segments. A pale stripe dorsad of the spiracles. Cervical shield pale with a broad, black subdorsal stripe. Spiracles dark, regularly flecked with golden brown. Head black.

Described from two larvae collected near Clarksville, Tenn., in March. Moth determined by Benjamin.

*Distribution.*—Florida and Tennessee.

*Food.*—Dead leaves of deciduous trees.

#### RENIA Gn.

1. Dorsal setae of body acutely, abruptly pointed, I no longer than the width of its tubercle, II but little longer than the width of its tubercle. Setigerous tubercle II paler than I. With a bright red middorsal line.----- *discoloralis*  
Dorsal setae of body blunt or clavate at tip, I usually distinctly longer than the width of its tubercle, II twice as long as the width of its tubercle.  
Setigerous tubercles I and II unicolorous black. With a dusky reddish or fuscous middorsal line or none.----- 2
2. Setigerous tubercles I and III with their bases confluent on abdominal segment 9.----- 4  
Setigerous tubercles I and III well separated, distinct, on abdominal segment 9.----- 3
3. Setigerous tubercles I and II with a subapical angulation (pl. 7, E). Body with a dusky middorsal line. Head pale brownish with slender black submedian ares. Spiracles pale with black rims.----- *factiosalis*  
Setigerous tubercles I and II conical or nearly so. Body without a middorsal pigment line. Head dusky brownish with a pale area above the base of the antennae, without submedian ares. Spiracles brownish with black rims.----- *sobriasis*
4. Seta I stout, clavate, but little longer than the width of its tubercle. Body setae white in live larvae. Venter marked with bright red from the spiracles ventrally. Spiracles pale with black rims.----- *flavipunctatis*  
Seta I rather slender, scarcely clavate, at least twice as long as the width of its tubercle. Body setae black or brown in live larvae. Venter marked with dusky reddish from the spiracles ventrally. Spiracles brownish with black rims.----- 5
5. Prespiracular shield connate with the cervical shield (pl. 9, D). Head unicolorous dusky brownish except for dark spots at setigerous tubercles.----- *salusalis*  
Prespiracular shield narrowly separated from the cervical shield (pl. 9, G). Head pale brown with a dusky spot beside the base of the front and with dark spots at the setigerous tubercles.----- *fraternalis*

#### RENIA DISCOLORALIS Gn.

Head 1.7 mm. broad. Body about 22 mm. long and 4 mm. broad at middle, thorax and abdominal segments to 6 of about equal width, 7 and 8 distinctly broadened; skin reticulate with obscure elevated lines, the interstices including

coarse, corrugated granules, particularly on the dorsum; general color light brown.

Dorsal coloration composed of a bright red reticulation on a yellowish ground, including a red middorsal stripe. A yellow line extending from ventrad of setigerous tubercle II diagonally upward to and including II on the following segment. Splotches of yellow throughout. Setigerous tubercles in yellow spots throughout, tubercle I black, II brownish. Spiracles pale yellowish. Venter paler than the dorsum, marked with bright red. Setigerous tubercles rather strongly elevated; setae I to V stout, suddenly constricted near the apex to a sharp point, I no longer than the width of its tubercle, II somewhat longer than the width of its tubercle. Head brown, coarsely granulose with obscure pits and with the distinct submedian arcs and the adfrontal areas dusky.

Described from 26 larvae collected near Clarksville, Tenn., in February and March 1927. Moths emerged in May and June, and were determined by Dyar and by Heinrich.

*Distribution.*—New York, Pennsylvania, Maryland, Virginia, Kentucky, Tennessee, and North Carolina.

*Food.*—Dead leaves of deciduous trees.

#### RENIA FACTIOSALIS (Wlk.)

Head 1.3 mm. broad. Body about 16 mm. long and 2.3 mm. broad at middle, of about equal width to abdominal segment 6, 7 and 8 somewhat broadened; skin reticulate with elevated lines; general color dusky.

Dorsally to setigerous tubercle III dusky, tinged rather than marked with reddish, with a strong, dusky middorsal stripe and a distinct, somewhat broken, pale line ventrad of II. Spiracles pale. Abruptly much paler ventrad of the spiracles, the ventral tubercles in pale spots encircled with reddish. Setigerous tubercles blackish, their setae pale, stout, blunt at tip, about twice as long as the width of their tubercles and tending to be set on the posterior face of the tubercles (pl. 7, E). Head pale brownish with black submedian arcs and a black stripe posterior to the ocelli.

Described from five larvae collected near Lexington, Ky., by K. B. McKinney and the writer in May 1927. A moth emerged June 21, and was determined by Benjamin.

*Distribution.*—United States: Maine, New Hampshire, New York, Connecticut, Pennsylvania, Maryland, Virginia, and Kentucky. Canada: Nova Scotia.

*Food.*—Dead leaves of deciduous trees.

#### RENIA SOBRIALIS (Wlk.)

Head 1.5 mm. broad. Body about 15 mm. long and 3.5 mm. broad at middle, thorax and abdominal segments to 6 of about equal width, 7 and 8 somewhat broadened; skin with a close-meshed reticulation composed of elevated lines; general color dark, approaching black.

Body, dorsal of the line of the prolegs, dusky, obscurely marked with livid reddish which appears ventrally as a bright red reticulation. No middorsal stripe. A pale line ventrad of setigerous tubercle II, more pronounced at juncture of segments and marked with red. Cervical shield black. Spiracles brown. Setigerous tubercles shining black, I to V slightly enlarged toward their tips, I (the shortest) at least twice as long as the breadth of its tubercle. Head dusky infuscated brown except the pale front, a pale stripe arising above base of antenna and extending to P<sup>1</sup> and a pale spot at posterior margin.

Described from eight larvae collected near Clarksville, Tenn., in February 1927. Moths emerged in March and April, and these were determined by Dyar and by Benjamin.

*Distribution.*—Maine, New York, Pennsylvania, Maryland, Virginia, North Carolina, Tennessee, Mississippi, and Florida. Canada: Nova Scotia.

*Food.*—Dead leaves of deciduous trees.

## RENIA FLAVIPUNCTALIS (Geyer)

Head 1.5 mm. broad. Body about 16 mm. long and 3.5 mm. broad at middle, broadening slightly from the prothorax posteriorly with abdominal segments 7 and 8 abruptly broadened; skin obscurely, finely reticulate with elevated lines, the reticulation replaced, especially on the dorsum, by corrugated subconical granules; general color dusky brownish.

Dorsal coloration composed of rather sharply defined dusky reddish and yellow spots. A distinct dusky reddish middorsal line. Traces of a yellow line between setigerous tubercles II and III and a similar line ventrad of the spiracles. Spiracles pale brownish. Venter pale, marked with bright red. Setigerous tubercles black, set in yellow spots throughout, strongly elevated; setae white, I clavate, II stout and not tapering toward the blunt tip, I slightly longer than the width of its tubercle, II twice as long as tubercle width. Head coarsely granulose, with obscure pits, brown, with dusky areas beside the front which may reach the posterior margin, no other markings.

Described from 25 larvae collected near Clarksville, Tenn., in March 1927. Moths emerged in June, and were determined by Dyar and later by Heinrich.

*Distribution.*—Maine, New Hampshire, Vermont, New York, Connecticut, Pennsylvania, New Jersey, Maryland, Ohio, Indiana, Illinois, Michigan, Minnesota, Tennessee, North Carolina, Georgia, Kansas, Colorado, New Mexico, and Texas.

*Food.*—Dead leaves of deciduous trees.

## RENIA SALUSALIS (Wlk.)

Head 1.5 mm. broad. Body about 17 mm. long and 3.5 mm. broad at middle, of about equal width on thorax and abdominal segments to 6, 7 and 8 somewhat broadened; skin closely reticulate with elevated lines; general color dusky brown.

Markings on body an obscure reddish, more evident from the spiracles ventrally. An obscure, dusky middorsal line. Subdorsal pale line not indicated except faintly at juncture of segments. Cervical shield brownish. Spiracles brownish. Setigerous tubercles black, their setae dusky or black, I to V slightly enlarged toward their tips, I (the shortest) at least twice as long as the breadth of the tubercle. Head unicolorous dusky brownish without traces of pale stripes, the setae in dark spots.

Described from five larvae collected near Clarksville, Tenn., in February 1927. Moths emerged in March and April, and males were determined by Benjamin.

*Distribution.*—New York, Pennsylvania, Ohio, Maryland, North Carolina, Tennessee, Alabama, Georgia, and Florida.

*Food.*—Dead leaves of deciduous trees.

## RENIA FRATERNALIS Sm.

Head 1.4 mm. broad. Body about 15 mm. long and 2.5 mm. broad at middle, of about equal width on thorax and abdominal segments to 6, 7 and 8 abruptly broader; skin reticulate with fine elevated lines, replaced irregularly by coarse, corrugated granules; general color dusky brownish.

Dorsal coloration composed of obscure reddish and pale spots, including a series of subdorsal pale spots at juncture of segments. Cervical shield brown. Spiracles very dark brownish. Venter paler than the dorsum and marked throughout with dark red. Setigerous tubercles black, their setae pale brownish and but slightly enlarged apically; I (the shortest) twice as long as the width of the tubercle. Head brown with a dilute blackish spot opposite base of front and an indefinite blackish line from tubercle O<sup>2</sup> to posterior margin of head; adfrontal areas blackish, no other markings.

Described from three larvae collected near Clarksville, Tenn., in March 1927. A moth emerged April 12 and was determined by Dyar.

*Distribution.*—North Carolina, Tennessee, Georgia, and Florida.

*Food.*—Dead leaves of deciduous trees.

### TETANOLITA Grt.

#### TETANOLITA PALLIGERA (Sm.)

Head 1.3 mm. broad. Body about 14 mm. long and 2 mm. broad at middle, abdominal segments of about equal width to 7 with 8 slightly broadened; skin bearing close, small, rounded granules interspersed with coarse rounded or subconical granules; general color dusky gray.

Dorsum, barely including setigerous tubercle II, pale with a middorsal black stripe and faintly tinged with reddish at juncture of segments. No subdorsal pale line. Supraspiracular area dark with isolated pale flecks. Spiracles black. A yellowish, broken line of flecks ventrad of the spiracles. Venter livid, marked with reddish and flecked with yellowish. Setigerous tubercles distinctly elevated, with a subapical angulation, black, surrounded by a pale or yellowish area composed of large granules; setae long, yellowish, stout, and but very slightly enlarged apically. Head pale brownish reticulate with dark brown.

Described from one larva collected at Yakima, Wash., April 18, 1930. A moth emerged June 3, 1930, and was determined by Heinrich.

*Distribution.*—California and Washington.

*Food.*—Dead apple leaves.

## APPENDIX

Following are descriptions and discussion of the four species of larvae for which no satisfactory place could be found in the general treatment.

### NOROPSIS Gn.

#### NOROPSIS HIEROGLYPHICA (Cram.)

Head 4.2 mm. broad. Body about 45 mm. long and 7 mm. broad at middle, tapering slightly posteriorly; skin set closely with minute, upright, slender papillae giving the effect of very short pubescence; general color white with transverse black lines dorsally.

A black middorsal line. A black longitudinal line well dorsad of setigerous tubercle III. About five transverse black lines on each segment terminating ventrally in a longitudinal black line including V. Venter white with a black line in the line of the legs and prolegs. Spiracles black. Setigerous tubercles minute. Cervical shield black. Anal shield yellow. Head smooth, apparently pale brown or yellow and apparently with small dark freckles.

Described from six alcoholic larvae all from the U. S. National Museum and labeled as follows: "On rice, Wadsworth, Tex., 17 Nov., 1948, Lot 43-19609, s. s. No. 5742, Browning No. 103"; "Guyedan, La., 3 Aug., 1925, E. R. Kalamback"; "St. Michael Plantation, Haiti, E. C. Leonard coll."

*Distribution.*—United States: Texas, Louisiana, Mississippi, Alabama, Georgia, and Florida. South America, Mexico, and the West Indies.

*Food plants.*—Van Zwaluwenburg (40) states that *Waltheria americana* and *Morongia leptoclada* are food plants in Porto Rico. A moth from Fairhope, Ala., bears the label "larva on pecan" while another from Louisiana is labeled "feeding on sweet potato."

In this species the venter of the 10th abdominal segment is free posteriorly; setigerous tubercle VII<sup>c</sup> is absent on abdominal segment 1; there are no secondary hairs on the prolegs or spinules on the coxae; the full normal complement of prolegs is present; the mandible has a basal process bearing an apical molar area; crochets on prolegs are unordinal and the spinneret bears a definite, open, apical silk pore.

It will be noted that *Noropsis* deviates from the conditions found in the *Catocalinae* in having the venter of abdominal segment 10 free posteriorly; in the absence of setigerous tubercle VII<sup>c</sup> on abdominal segment 1 and in the presence of an open, apical silk pore on the spinneret. On the other hand, *Noropsis* agrees in these and other characters with the *Cuculliinae* but is different in habitus.

### BAILEYA Grt.

#### BAILEYA DOUBLEDAYI (Gn.)

It is not possible to determine the character of the 10th abdominal segment with certainty in the two alcoholic specimens available, since the rectum is strongly everted in both, and surmises as to the systematic position of *Baileya* are further complicated owing to the presence of a definite, open, apical silk pore on the spinneret. This spin-

neret character would provide strong support for the view that *Baileya* does not belong in the Quadrifinae and none of the several peculiarities found in other Sarrothripinae is present in *Baileya*. A summary of the pertinent structural characters follows:

Prolegs present on abdominal segments 3 and 4, crotchets unioordinal and not appendiculate; setigerous tubercles and their setae minute, VII<sup>a</sup> absent on abdominal segment 1, VII<sup>b</sup> anterior to the transverse line of tubercles VII<sup>b</sup> on abdominal segments 1 and 2, seta III normal on 9, postero-medial setae on anal shield and subanal setae not modified as an anal fork, seta III on abdominal segment 2 slightly nearer to II than to I (31:34); heights of prothoracic, first abdominal and eighth abdominal spiracles in a proportion on the order of 14:13:17; no callus between the setae on femur or tibia; tarsal setae not modified, setiform; mandible with a basal process bearing an apical molar area, spinneret cylindrical with an open, apical silk pore length equal to two or three times the median width, seta O<sup>1</sup> twice as near to ocellus IV as to III (3:7) length of third, second, and first segments of labial palpus in a proportion on the order of 7:4:8, labial palpus slightly longer than spinneret, seta F<sup>1</sup> well removed from lateral margin of front, transverse line of setae P<sup>1</sup> at apex of adfrontal areas, occipital angle very obtuse.

Head 1.8 mm. broad. Body about 15 mm. long and 2.4 mm. broad at middle, tapering posteriorly, the thorax somewhat broader than anterior abdominal segments particularly in a lateral view; skin smooth; general color not determinable but probably green.

Setigerous tubercle III on mesothorax and metathorax in a conspicuous white spot. Such other markings as may have been present have been removed by the preservative. Spiracles pale brown with pale brown rim. Anal shield closely, rather coarsely granulose. Setigerous tubercles minute, their setae short. Head smooth, frontal setae nearer to basal than to lateral margin of front (4:8). Mandible with a basal process bearing an apical molar area.

Described from two alcoholic larvae reared to maturity at Arlington, Va., April-May 1950, on *Alnus incana*, by J. G. Franclemont.

*Distribution*.—Maine, Massachusetts, New York, Pennsylvania, North Carolina, and Virginia.

*Food plant*.—Alder (*Alnus incana*) (Franclemont).

## THURBERIPHAGA Dyar

### THURBERIPHAGA DIFFUSA (Barnes)

The venter of abdominal segment 10 is free posteriorly. Otherwise *Thurberiphaga* has a number of characters found in Group 8 of the Amphipyriinae but these resemblances may be due to convergent adaptations to a boring habit rather than to actual genetic relationship.

Head 3.2 mm. broad. Body tapering posteriorly, length and width not determinable; skin bearing coarse isolated, nearly flat granules; general color bright pink throughout.

Body bright pink throughout without markings. Venter of abdominal segment 10 free posteriorly. Setigerous tubercles moderately large, dark, nearly flat, I, II and III fused (on one plate) on abdominal segment 9, II<sup>b</sup> on thorax without a sclerotized bar connecting the tubercle with the ventral muscle attachment, IV and V on abdominal segment 8 in the same position as on 7, II<sup>c</sup> not on the cervical shield. Spiracles dark brown, that on 8 much more dorsal than the others, sieve plate sunken and sclerotized laterally. Hind coxae nearly the femur width apart, fore coxae free, independently movable without spinules. A V-shaped impression between prolegs. Head brown freckled obscurely with darker brown, mandible without a basal tooth or process on oral face, bearing 2 setae. Spinneret with a visible apical silk pore; cylindrical, length equal to less than twice the median width and approximately equal to that of the labial palpus. Length of third segment of labial palpus about one-third that of the basal segment and but slightly more than the second segment (3:2:9).

Described from 14 alcoholic larvae: "From *Thurberia*, Coyote Mts., Arizona, Sept. 14, 1929," collected by T. P. Cassidy.

*Distribution*.—Arizona.

*Food plant*.—Bores in bolls of tree cotton (*Thurberia*).

### MAGUSA Wlk.

#### MAGUSA ORBIFERA (Wlk.)

The venter of abdominal segment 10 is free posteriorly in *Magusa*; setigerous tubercle VII<sup>c</sup> is absent on abdominal segment 1; an open, apical silk pore is present on the spinneret; there are no secondary hairs on the prolegs or spinules on the coxae; five pairs of prolegs are present; the labial palpus is less than half as long as the spinneret and the mandible is without a basal tooth or process on oral face.

*Magusa* does not seem to be a member of the Cuculliinae, where it would be placed on the basis of the above structural characters, but might be considered as an aberrant genus in either Group 6 or 7 in the Amphipyriinae if the character of abdominal segment 10 were considered as a sporadic variation.

Head 2.6 mm. broad. Body about 35 mm. long and 5 mm. broad at middle, abdominal segment 8 slightly broadened and bearing a conspicuous, rounded dorsal hump; skin smooth; general color not determinable.

Dorsum to more than half way between setigerous tubercle II and III much paler than the remainder of the supraspiracular area, the coloration composed of pale longitudinal lines middorsally, between I and II and in the line of II and a pale stripe ventrad of II, alternating with lines of a subdued darker shade; all terminating abruptly at abdominal segment 8 which appears to be paler than the anterior segments. A narrow black stripe with III in ventral margin including a submedian pale line. Spiracles black. Subventral pale stripe including numerous small black spots in dorsal half and all of the spiracles except that on 8 and bordered ventrally by a black stripe including V which is bordered ventrally by a white line. Setigerous tubercles minute, in black dots. Head apparently yellow, without markings excepting black dots at the setal insertions, the spinneret distinctly broadened at apex (pl. 3, D).

Described from 7 alcoholic larvae from the U. S. National Museum: 5 larvae "On *Karwinskia humboldtiana*, Rio Grande City, Tex., col. 13 Aug. '38, Lot 38-13850, Roma 231," and 2 larvae, same source and food plant, "Roma, Tex., 30.IV.'38, Lots 38-6109 and 6110. Moths reared under Roma 203."

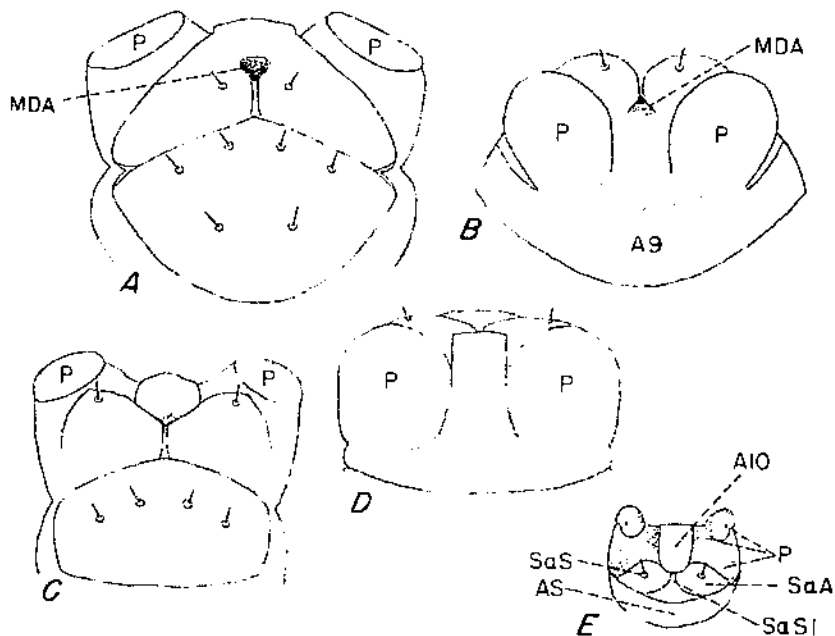
*Distribution*.—Maine, New York, Pennsylvania, District of Columbia, Indiana, Kentucky, Tennessee, Kansas, Arizona, New Mexico, Texas, Florida, and southward into South America. Breeding range in the United States probably limited to the States bordering on Mexico and those bordering on the Gulf of Mexico.

*Foodplants*.—*Karwinskia humboldtiana* and black ironwood (*Krugiodendron ferreum*).

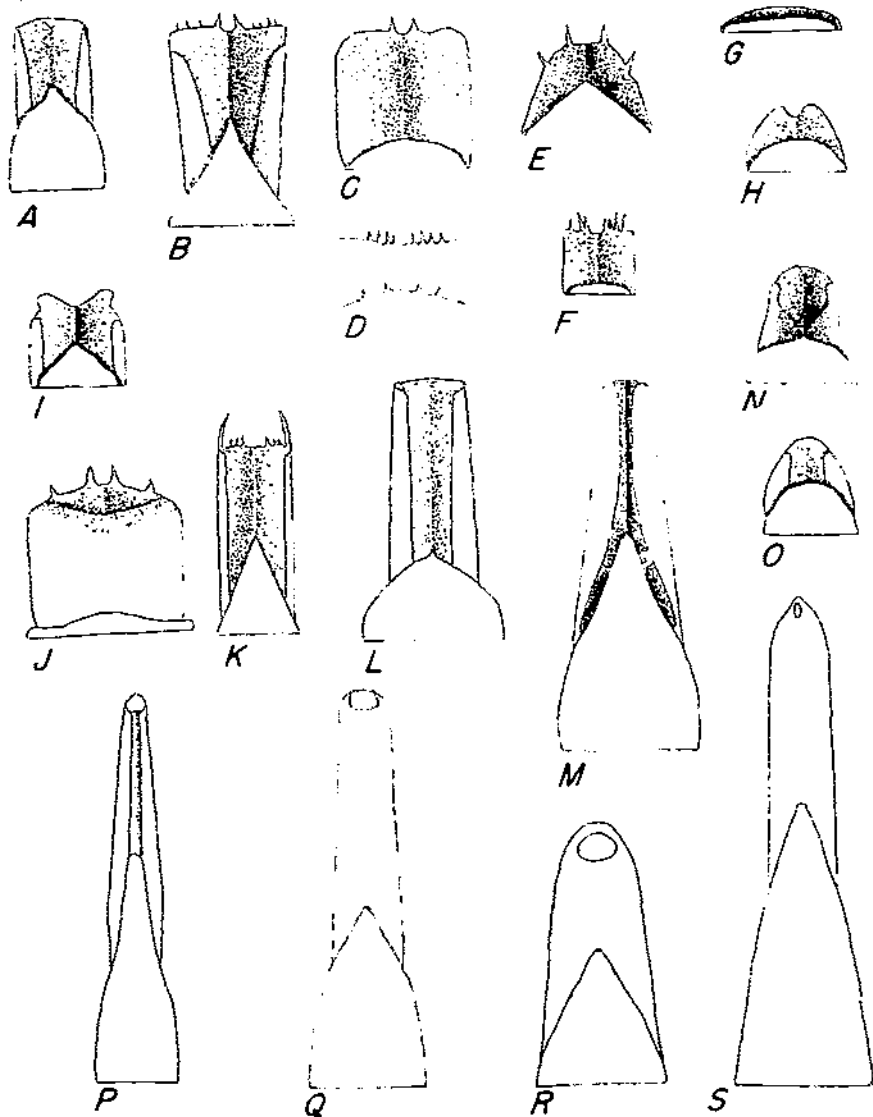
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- A. *Anaplectoides prasina*: Posterior view of abdominal segment 10 in the plane of the ventral surface of the segment, showing the venter of the segment confluent with the subanal area between the median depressed area (MDA) and the base of the proleg (P).
- B. *Anaplectoides prasina*: Ventral view of abdominal segment 10; MDA, median depressed area; A9, abdominal segment 9.
- C. *Cucullia montanae*: Posterior view of abdominal segment 10 in the plane of the ventral surface of the segment, showing 10 free posteriorly.
- D. *Cucullia montanae*: Ventral view of abdominal segment 10.
- E. *Cucullia montanae*: Somewhat oblique posterior view of abdominal segment 10; A10, abdominal segment 10; P, proleg; SaA, subanal area; AS, anal shield; SaS, subanal seta; SaSl, subanal slit.



Spinnerets of larvae, all drawn to the same scale. Figures A-O: Dorsal wall of spinneret partially or completely collapsed, the product of the silk gland being extruded through a transverse or U-shaped apical slit, seldom visible. Figures P-S: Spinneret with an open, apical or subapical silk pore. Other illustrations of this type will be found on plate 3.

Plate 2—Continued

Phalaenidac (figs. A-I)

- A. *Diarsia rosaria*.
- B. *Anaplectoides prasina*.
- C. *Graphiphora c-nigrum*.
- D. *Graphiphora c-nigrum*: Anterior margin of spinneret, showing variation in the number of spinules.
- E. *Peridroma margaritosa*.
- F. *Anicla infecta*.
- G. *Agrotis (Feltia) subgothica*.
- H. *Agrotis (Feltia) ducens*.
- I. *Abagrotis barnesi*.

Hadeninae (figs. J-O)

- J. *Xanthopastis timaris*.
- K. *Leucania sarcta*.
- L. *Polia lutra*.
- M. *Polia purpurissata*.
- N. *Xylomyges rubrica*.
- O. *Orthostia hibisci*.
- P. *Lithophane innominata*.
- Q. *Septis castanea*.
- R. *Acronycta obliqua*.
- S. *Cucullia montanae*.

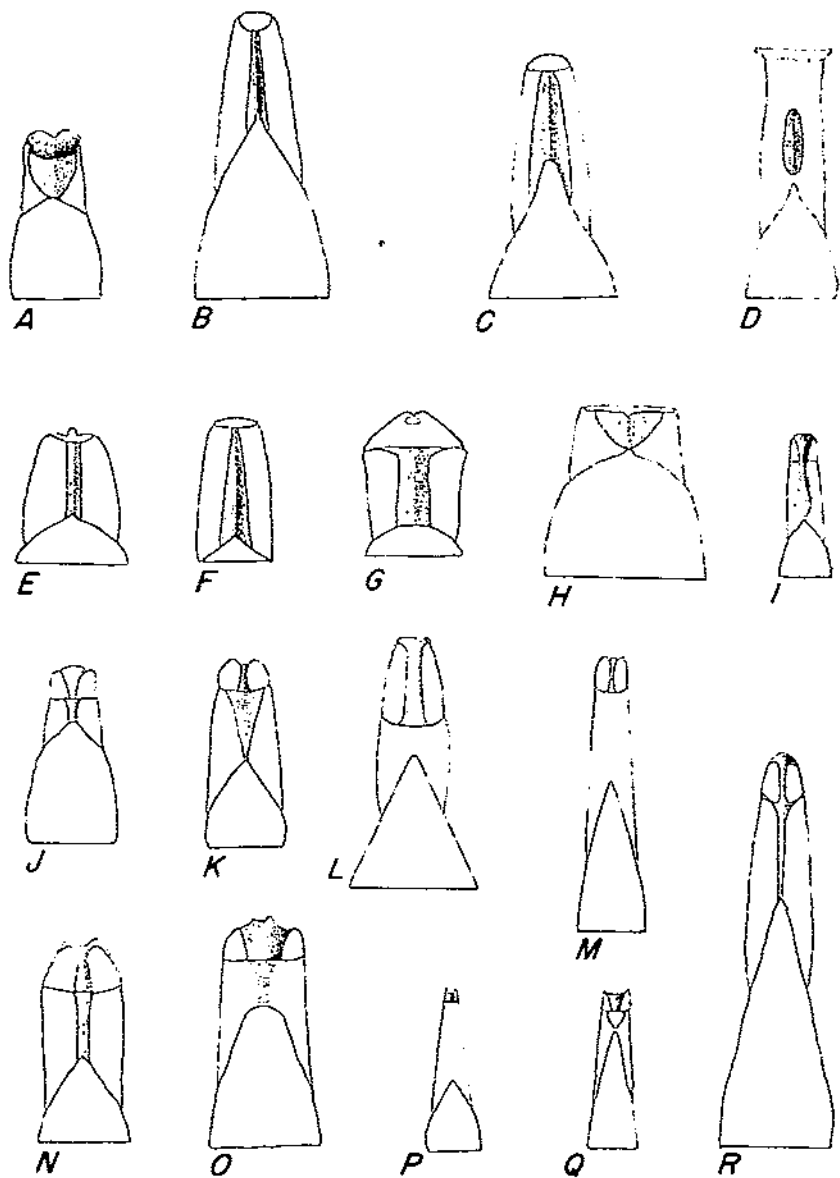
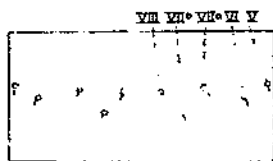


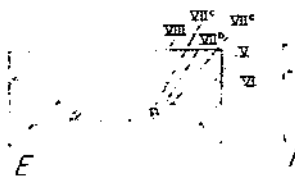
Plate 3—Continued

Spinnerets of larvae, all drawn to the same scale. Figures A-H: Spinneret with an open apical silk pore (see also pl. 2). Figures I-R: Spinneret with lateral lobes apically and silk pore concealed.

- A. *Nedra stewarti*.
- B. *Xylena brucei*.
- C. *Platypolia contadina*.
- D. *Magusa orbifera*.
- E. *Pseudogluca olivata*.
- F. *Epigluca apiata*.
- G. *Prodenia ornithogalli*.
- H. *Euthisanotia grata*.
- I. *Sarothripus frigidana*.
- J. *Marathyssa inficita*.
- K. *Heteranassa mina*.
- L. *Scoliopteryx libatrix*.
- M. *Anticarsia gemmatilis*.
- N. *Caenurgia crechtea*.
- O. *Zale lunata*.
- P. *Hypena decorata*.
- Q. *Lithacodia muscosula*.
- R. *Ulosyneda vulens*.



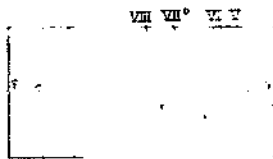
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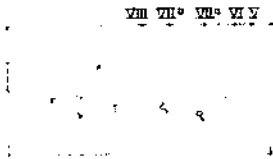
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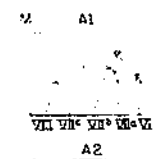
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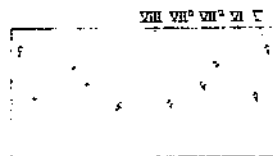
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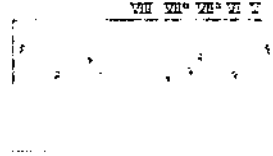
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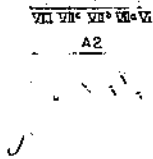
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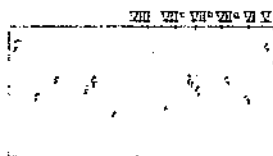
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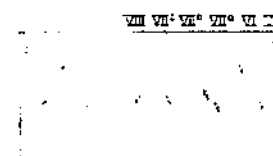
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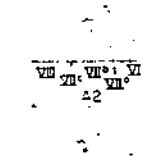
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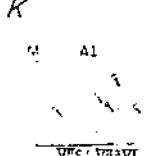
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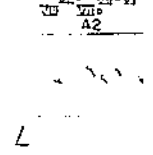
H



A2



K



L

Plate 4—Continued

- A. *Bagisura rectifascia*: Abdominal segment 7, ventral view, showing two members of the VII group present.
- B. *Hypena decorata*: Abdominal segment 7, ventral view, showing but one member of the VII group present.
- C. *Cucullia postera*: Abdominal segment 1, ventral view, showing seta VII<sup>c</sup> absent.
- D. *Hypena decorata*: Abdominal segment 1, ventral view, showing seta VII<sup>c</sup> present.
- E. *Rachiplusia ou*: Abdominal segment 4, ventral view, showing vestigial prolegs absent and seta VIII migrated toward the midventral line.
- F. *Euthisanotia grata*: Abdominal segment 7, ventral view, showing two members of the VII group present.
- G. *Graphiphora smithi*: Abdominal segment 1, ventral view, showing absence of VII<sup>a</sup> on this segment.
- H. *Zale lunata*: Abdominal segment 1, ventral view, showing seta VII<sup>c</sup> present on this segment.
- I. *Argyrogramma verruca*: Abdominal segment 4, ventral view, showing setae VII<sup>b</sup>, VII<sup>c</sup>, and VIII grouped closely on base of vestigial proleg.
- J. *Anticarsia gemmatilis*: Left half of venter of abdominal segments 1 and 2, showing arrangement of VII group practically the same on both segments, with line VII<sup>b</sup>-VII<sup>a</sup> not greater than VII<sup>b</sup>-VII<sup>c</sup>; A1, abdominal segment 1; A2, abdominal segment 2; M, midventral line.
- K. *Catocala* sp.: Left half of venter of abdominal segments 1 and 2, showing arrangement of the VII group practically the same on both segments, with line VII<sup>b</sup>-VII<sup>a</sup> twice as long as VII<sup>b</sup>-VII<sup>c</sup>; A1, abdominal segment 1; A2, abdominal segment 2; M, midventral line.
- L. *Zale lunata*: Left half of venter of abdominal segments 1 and 2, showing arrangement of the setae of the VII group decidedly different on 1 from that on 2, with VII<sup>a</sup> far anterior to the transverse line of VII<sup>c</sup> on 1 and but slightly anterior on 2; A1, abdominal segment 1; A2, abdominal segment 2; M, midventral line.



Mandibles with a basal or subbasal tooth or process

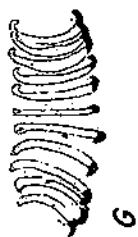
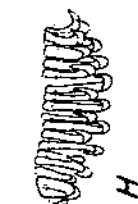
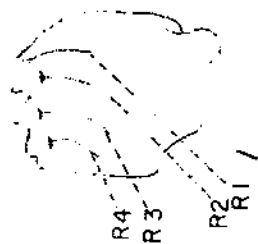
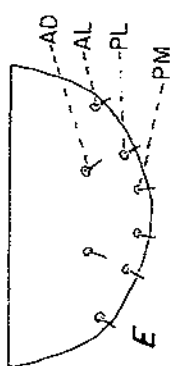
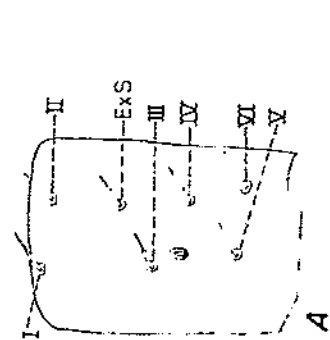
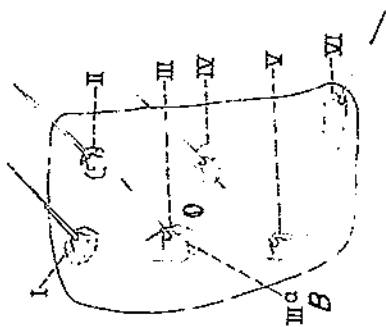
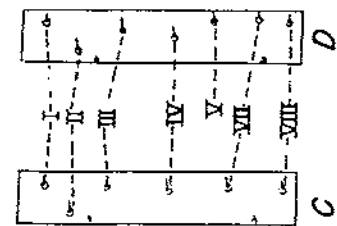
- A. *Psectraglaea carnosu.*
- B. *Euclirrhoctidii pumipina.*
- C. *Xylena nupera.*
- D. *Polia tegilima.*

- E. *Polia tulra.*
- F. *Abagrotis erratica.*
- G. *Heliothis virescens.*
- H. *Graphiphora c-nigrum.*

Mandibles without a basal or subbasal tooth or process

- I. *Anicla infecta.*
- J. *Feltia ducens.*
- K. *Septis (Crymodes) deuslator.*

- L. *Chrysaspidia putnami.*
- M. *Argyrogramma verruca.*
- N. *Trichoplusia ni (var. brassicae)*



- A. *Alabama argillacea*: Setal map, left side of abdominal segment 6, showing location of "extra" seta (ExS).
- B. *Scolecocampa liburna*: Setal map of left side of abdominal segment 6, showing absence of the "extra" seta.
- C. *Argrolis (Feltia) ducens*: Setal map of left side of abdominal segment 9, showing absence of seta V.
- D. *Ufeus hulsti*: Setal map left side of abdominal segment 9, showing location of setigerous tubercle V.
- E. *Hemieuxoa rudens*: Anal shield, dorsal view, showing arrangement of setae: AD, antero-dorsal; AL, antero-lateral; PL, postero-lateral; PM, postero-median.
- F. *Bagisara rectifascia*: A proleg crochet, showing the large sub-apical tooth.
- G. *Agrotis (Feltia) ducens*: Crochets on proleg, showing unioordinal condition.
- H. *Argyrogramma verruca*: Crochets on proleg, showing biordinal condition.
- I. Mandible of larva with ribs numbered. Ribs 2, 3, and 4 terminate in distal molar areas. Apparently distal molar area No. 1 is not developed except in some species of *Catocala*.

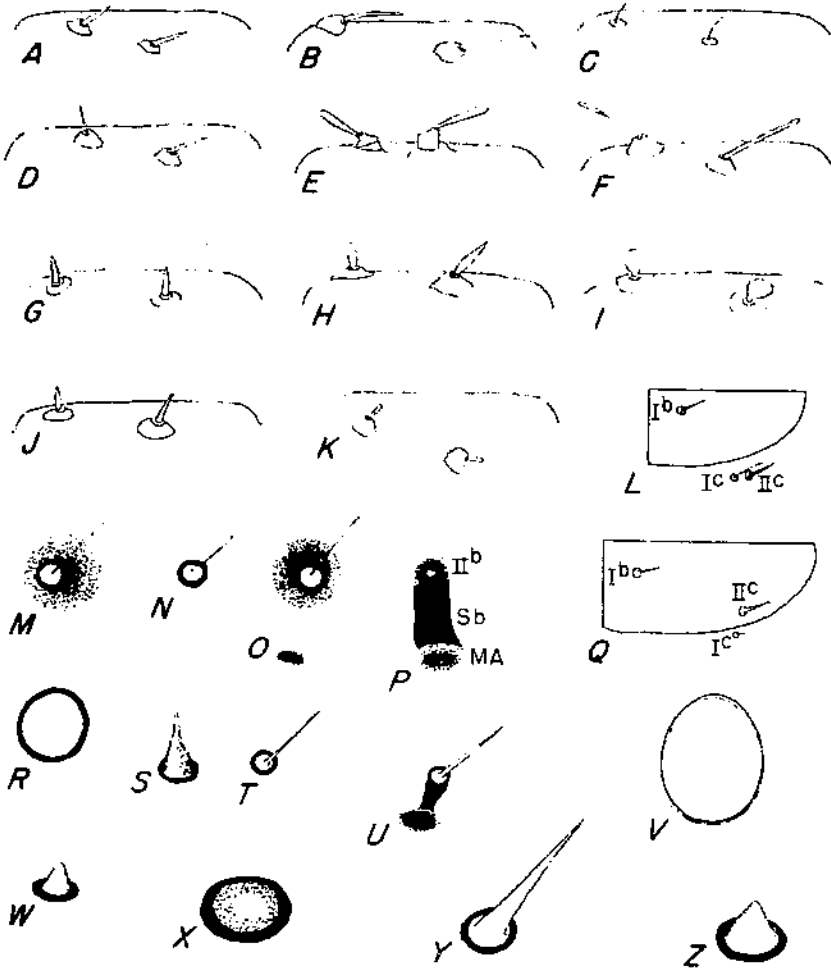


Plate 7—Continued

Figures A-K: Dorsum of abdominal segment 5, showing character of tubercles and setae I and II.

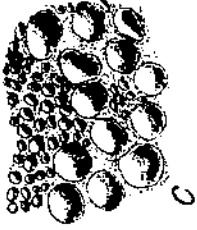
- A. *Phalaenostola laurentioides*.
- B. *Philometra metonalis*.
- C. *Hormisa lilophora*.
- D. *Pallia asopialis*.
- E. *Renia factiosalis*.
- F. *Phalaenophana pyramusalis*.
- G. *Chytolita morbidalis*.
- H. *Renia discoloralis*.
- I. *Bleptina inferior*.
- J. *Zanclognatha pedipilalis*.
- K. *Arugisa latiorella*.
- L. *Laphygma frugiperda*: Lateral margin of cervical shield, showing setigerous tubercle II\* ventrad of the lateral margin.
- M. *Agrotis (Feltia) ducens*: Showing character of setigerous tubercle and seta III on abdominal segment 9.
- N. *Copablepharon alba*: Showing character of setigerous tubercle and seta III on abdominal segment 9.
- O. *Agrotis (Feltia) ducens*: showing absence of a sclerotized bar connecting setigerous tubercle II<sup>b</sup> of the mesothorax with the ventral muscle attachment.
- P. *Spaelotis clandestina*: Showing a sclerotized bar (Sb) connecting setigerous tubercle II<sup>b</sup> with the ventral muscle attachment (MA).
- Q. *Septis castanea*: Lateral margin of cervical shield, showing setigerous tubercle II\* on the cervical shield.
- R. *Heteranassa mima*: Showing setigerous tubercle VIII on abdominal segment 2 without a seta.
- S. *Allotria elonympa*: Showing character of seta VIII on the thorax.
- T. *Agrotis (Feltia) ducens*: Showing setigerous tubercle II\* on the metathorax without a sclerotized ventral bar.
- U. "*Anomogyne*" *infimalis*: Showing II\* on the metathorax with a sclerotized ventral bar connecting the tubercle with the ventral muscle attachment.
- V. *Melipotis indomita*: Showing setigerous tubercle VIII on abdominal segment 2 without a seta.
- W. *Strenoloma lunilinea*: Showing the seta on setigerous tubercle VIII on abdominal segment 2 replaced by a small, fleshy cone.
- X. *Catocala aholibah*: Showing setigerous tubercle V on mesothorax without a seta or fleshy cone.
- Y. *Catocala nevadensis*: Showing setigerous tubercle V on mesothorax with a seta.
- Z. *Catocala concumbens*: Showing the seta on setigerous tubercle V on mesothorax replaced by a short, fleshy cone.



A



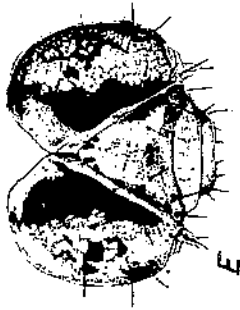
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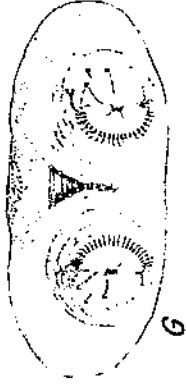
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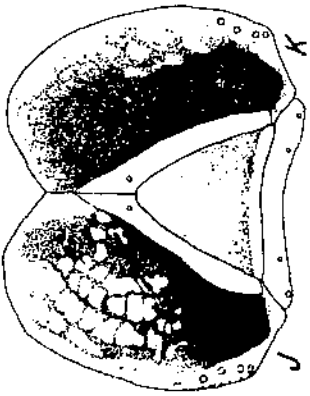
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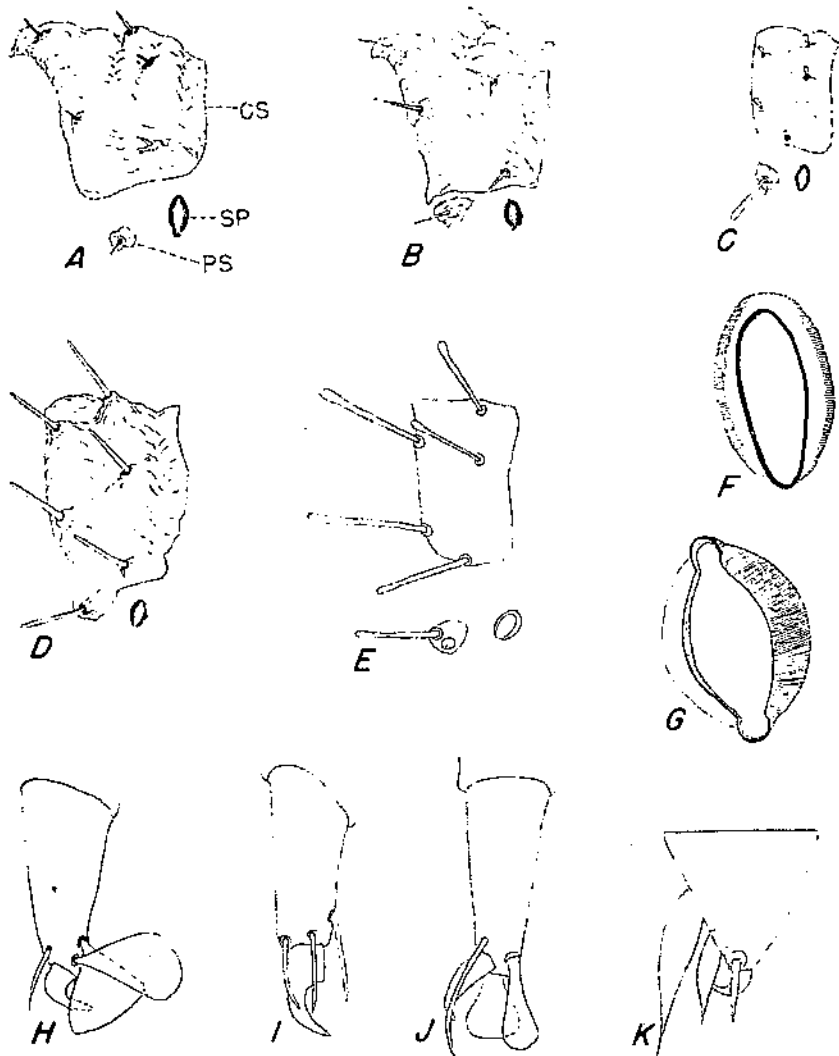


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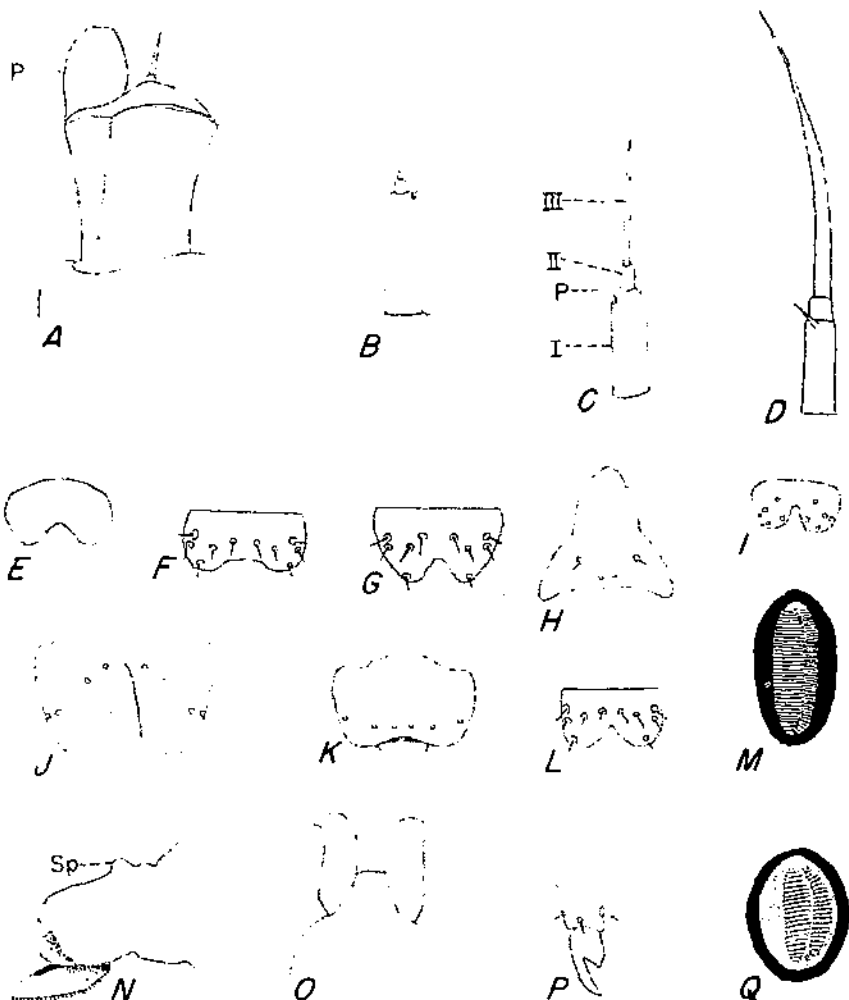


J

- A. *Agrotis (Feltia) gladiaria*: Showing skin granules set contiguously like blocks in a pavement.
- B. *Palthis asopialis*: Showing upright, spinelike skin granules.
- C. *Agrotis (Feltia) ducens*: Showing coarse, isolated convex skin granules.
- D. *Agrotis (Feltia) subterranea*: Showing isolated, subconical skin granules.
- E. *Agrotis (Feltia) ducens*: Head, showing reticulate type of coloration and well-developed submedian arcs.
- F. *Euxoa messoria*: Head, showing flecked ("freckled") type of coloration and obsolescent submedian arcs.
- G. *Spaelotis clandestina*: Venter of abdominal segment 3, showing muscle attachments arranged in a Y-shaped pattern.
- H. *Cucullia laetifica*: Head, showing color pattern.
- I. *Cucullia speyeri*: Head, showing color pattern.
- J. *Prodenia praefica*: Head (right half), showing full, dark reticulation.
- K. *Prodenia ornithogalli*: Head (left half), showing sparse reticulation.



- A. *Zanclognatha cruralis*: Portion of prothorax, lateral view, showing relation of cervical shield (CS), spiracle (Sp), and prespiracular shields (Ps). Seta II<sup>a</sup> is on the cervical shield.
- B. *Renia discoloralis*: Portion of prothorax, lateral view, showing relation of cervical shield, spiracle and prespiracular shield.
- C. *Bteptina inferior*: Portion of prothorax, lateral view, showing relation of cervical shield, spiracle and prespiracular shield.
- D. *Renia satusalis*: Portion of prothorax, lateral view, showing relation of cervical shield, spiracle, and prespiracular shield.
- E. *Epizeuxis americanalis*: Portion of prothorax, lateral view, showing relation of cervical shield, spiracle, and prespiracular shield.
- F. *Epizeuxis lubricalis*: Prothoracic spiracle, showing nonemarginate ends.
- G. *Renia flavipunctalis*: Prothoracic spiracle, showing emarginate ends.
- H. *Epizeuxis forbesi*: Tarsus, showing character of apical setae.
- I. *Epizeuxis lubricalis*: Tarsus, showing character of apical setae.
- J. *Epizeuxis julia*: Tarsus, showing character of apical setae.
- K. *Ozarba aerea*: Tarsus, showing character of apical setae.



- A. *Epizeuxis rotundalis*: Labial palpus showing unique dome-shaped papilla (P).
- B. *Melipotis indominata*: Labial palpus showing extremely short third segment.
- C. *Hypena californica*: Labial palpus; I, II, III segments 1, 2, and 3, P, papilla.
- D. *Bagisara rectifuscia*: Labial palpus showing the extraordinarily long, curved third segment.
- E. *Zale galbanata*: Labrum showing the broad emargination in anterior margin. The setae are omitted.
- F. *Asceptis fumeola*: Labrum showing the broad, shallow emargination in anterior margin.
- G. *Platysenta sutor*: Labrum showing emargination in anterior margin.
- H. *Gonodonta unica*: Front, broadened strongly basally.
- I. *Zale undularis*: Labrum, showing the narrow emargination in anterior margin.
- J. *Euparthenos nubilis*: Labrum showing the very deep, narrow emargination in anterior margin.
- K. *Zale obliqua*: Labrum, showing the extremely shallow emargination in anterior margin.
- L. *Aseptis binotata*: Labrum, showing emargination in anterior margin.
- M. *Apamea kieferi*: Spiracle on abdominal segment 1.
- N. *Panopoda rufimargo*: Proleg, lateral view, showing subconical projection (Sp) at dorsal margin of proleg shield.
- O. *Paectes delineaata*: Proleg, outer face, showing the fleshy projections at each end of the series of crochets. Normally, these extend at right angles to the proleg.
- P. *Autographa biloba*: Claw on leg, showing the basal tooth.
- Q. *Achatodes zcae*: Spiracle on abdominal segment 1.

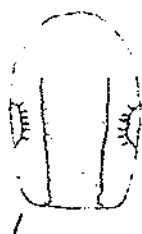
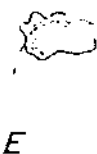
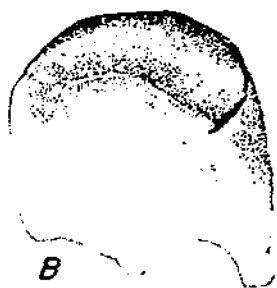
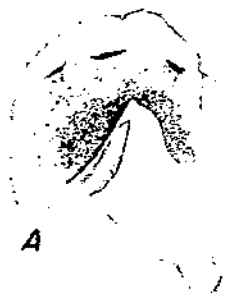


Plate 11—Continued

- A. *Catocala macstosa*: Mandible bearing a pointed basal process on oral face.
- B. *Catocala vidua*: Mandible with a narrow, transverse, molar area in a groove.
- C. *Catocala illecta*: Mandible with a basal process bearing an apical molar area.
- D. *Catocala illecta*: Basal process on mandible, showing the coarse granules on the molar area.
- E. *Catocala nuptialis*: Basal process on mandible, showing the molar area surrounded by an irregularly produced rim like a ruffe.
- F. *Catocala amestris*: Basal process on mandible, showing the small, simple, molar area.
- G. *Catocala residua*: Labrum, showing the narrow emargination in anterior margin.
- H. *Catocala amestris*: Labrum, showing the broad emargination in anterior margin.
- I. *Spaelotis clandestina*: Hypopharynx, dorsal view.
- J. *Anida infecta*: Hypopharynx, dorsal view.
- K. *Butia deducta*: Hypopharynx, dorsal view.
- L. *Synedoida divergens*: Hypopharynx, dorsal view.
- M. *Drasteria occulta*: Hypopharynx, dorsal view.
- N. *Melipotis indomita*: Ventral margin of right mandible, basally, showing the flat, subcircular, setal area.
- O. *Synedoida divergens*: Ventral margin of right mandible, basally, showing the setae on an elongate, convex area.
- P. *Cucullia laetifica*: Dorsum of abdominal segment 3 showing the color pattern.
- Q. *Cucullia* No. 8: Same as for figure P.

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