

CONTRIBUTIONS TOWARD A MONOGRAPH OF THE NOCTUIDÆ OF
TEMPERATE NORTH AMERICA.—REVISION OF THE SPECIES OF
HADENA REFERABLE TO XYLOPHASIA AND LUPERINA.

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(With Plates XXXVI, XXXVII.)

As is the case with so many of the Noctuid genera, *Hadena* contains moths of quite diverse habitus and structure and which can not remain associated under the same name. Since I originally prepared the revision of the entire genus, considerable new material has come to hand, principally in those groups which are not typical, strictly. Of the forms referable to *Xylophasia* and *Luperina*, I have nearly all the species, and as they are conveniently separable from the balance of the series I have concluded to present *Hadena* in fragmentary form, premising that I believe that the genus will be eventually restricted to the species here treated, and possibly *Luperina* or *Xylophasia* may take generic rank. In its broad sense *Hadena* contains moths of small to large size, normal noctuid maculation usually present. Eyes naked; front smooth; antennæ variable, but usually not pectinated or brush-like; palpi stout, reaching middle of front; tongue long and strong, spiral; legs stout, tibiæ unarmed; thorax with divided crest; abdomen with dorsal and lateral tufts; primaries long and narrow to broad and short, apices rounded to apices acute. The genitalia are also various, and taking the genus as a whole there is no agreement. Taking the extremes, there is very little indeed to suggest generic identity between *cuculliformis* and *turbulenta*, and no scientific end can be gained by holding together such an unnatural association. The genital structure of the male affords a convenient basis for division, those species treated here all agreeing in having the harpes abruptly modified into a trigonate tip, set almost at right angles to the harpe, and inside of this bearing a single corneous clasper of variable length, supplemented in some cases by small secondary claspers attached to the harpes nearer to base. The species are all of good size, the tuftings are distinct, and the habitus reveals the relationship at a glance. The difference between *Luperina* and *Xylophasia* is in the abdominal tufting, that of *Luperina* being loose

and confined to the basal segments, the abdomen and body also more cylindric, while in the others the tufts are definite, distinct, truncate bunches of hair, the abdomen and body more depressed or flattened, less cylindric. There is a general agreement in the sexual characters of the male, with one serious exception only. *L. stipata* Morr., while otherwise perfectly agreeing with *loculata* and others, is thoroughly aberrant in genital characters, and forms a solitary exception to an otherwise uniform tendency.

For present convenience the species of *Luperina* will be treated first, and to this subgenus must be referred those species which in the characters of *Hadena* lack the distinct tufts of the abdomen, which becomes also more cylindric and plump in both sexes. The thoracic tuftings are reduced in size, the vestiture is more smooth and scaly, and the thorax itself seems shorter.

The species are readily distinguished :

Burgessi—of which *Hadena discors* is a synonym—and *longula* are dark gray species with a narrow black streak connecting the median lines.

Burgessi has white secondaries, the outer margin narrowly dusky, and the primaries are rather narrow. The clasper is long and slender, somewhat thickened toward the middle.

Longula is decidedly broader winged with essentially the same markings as the preceding ; but the secondaries are dusky and the clasper of the male is much shorter and thicker.

Passer Gn (*loculata* Morr.) is readily distinguished by the even brown color, more or less verging to gray, and the prominent black claviform, the ordinary spots also more or less distinctly black ringed. The primaries are rather broader, with obtuse, somewhat rounded apices. The genitalia of the ♂ lack the clasper, and the tip of harpes is rather narrower than usual, with a dense brush of spinules inferiorly. *Conspicua* is an aberration rather than a variety, and is distinguished by a paler, rather red, color, with a dusky suffusion over the cell, the lines distinct, and a distinct black shade before the s. t. line.

Niveivenosa is readily distinguished by the white marked veins, giving it a deceptive resemblance to certain species of the *quadridentata* group of *Agrotis* (*Carneades*), which misled Mr. Grote in his generic reference of the species. I have seen no male.

Stipata has the median vein and its forks at end of cell white to the t. p. line, and a heavy black shade through median space, easily defining the species. In genital structure the species is aberrant. The harpes are broad, rather even, the superior margin thickened, more chitinous and obtusely prolonged, while from the inner side, just within the tip, they give rise to two small acute processes which are corneous. The relationship of this form is obscure ; but I can not find a more satisfactory position for it at present.

In synoptic form the species separate as follows :

All the veins white marked	NIVEIVENOSA.
Median vein and branches to t. p. line white marked ; a heavy black line or shade connecting the median lines	STIPATA
None of the veins white.	
No connecting line between median lines.	
Color brown to grayish brown ; claviform distinct, black, ordinary spots black marked	PASSER
A narrow black line connecting the median lines.	
Secondaries white, with a narrow dusky margin	BURGESSI
Secondaries dusky	LONGULA

The species of *Xylophasia* are much more numerous and separate readily into groups or series which may be typified by some of the more common species. The groups will be roughly defined here, and under separate headings the species will be described.

Group *vultuosa* is readily recognizable by the character of the markings in the terminal and subterminal space. The former is darker and sends into the s. t. space two spurs, giving the whole the appearance of two triangular dark shades. The median lines are incomplete or punctiform.

Group *finitima* has a more even ground color, the median lines distinct, while the s. t. line is indefinite or obsolete, and there is no trace of the triangular dark patches.

Group *sputatrix* contains species in which the transverse lines are obsolete or only traceable, never distinct, while the reniform and sometimes the orbicular are white marked, blotchy.

Group *devastatrix* has the transverse maculation distinct, the terminal space concolorous or paler, never darker ; s. t. lines preceded by a series of sagittate black spots which are sometimes confluent.

Group *alticola* is represented by an evenly colored species in which all the maculation is distinct on an even ground not emphasized by darker shadings.

Group *arctica* has also the transverse maculation distinct, but the s. t. space is paler than the median or terminal space, and the latter is darkest. The s. t. line is sometimes preceded by a darker shade, but never by sagittate spots. As compared with the preceding the species of this group have the apices somewhat more marked and the wings more distinctly trigonate.

Group *perpensa* is somewhat aberrant and is distinguished by a longitudinal black shade from the base to the t. p. line.

None of the preceding species have in the s. t. line a clearly defined W mark. All the following are so distinguished, the outward indentation of the s. t. line being marked on veins three and four.

Group *cariosa* contains those species in which the secondaries are of various shades of gray to smoky brown, while group *inordinata* contains those species in which the secondaries are yellow, with a black outer marginal band.

In synoptic form the groups may be distinguished by the following table:

No W-mark in the s. t. line.

S. t. space with a triangular dark shade at middle and another at hind angle, crossing s. t. line at those points; transverse lines incomplete or punctiform Group VULTUOSA.

S. t. space concolorous; s. t. line obsolete or indefinite, median lines distinct.

Group FINITIMA.

Transverse maculation all obsolete, reniform more or less distinctly white marked.

Group SPUTATRIX.

Transverse maculation all evident.

S. t. space not paler; terminal space concolorous or paler, never darker; s. t. line preceded by a series of sagittate black spots which are sometimes confluent..... Group DEVASTATRIX.

As before; s. t. line distinct, no preceding dark shade or spots.... Group ALTICOLA.

S. t. space paler than median or terminal space, the latter darkest; s. t. line sometimes preceded by darker shades, never by sagittate spots; primaries wider with more produced apices..... Group ARCTICA.

Evenly colored; a distinct black longitudinal shade from base to t. p. line.

Group PERPENZA.

A distinct W-mark in s. t. line on veins three and four.

Secondaries white or dusky..... Group CARIOSA.

Secondaries yellow with black margin..... Group INORDINATA.

GENUS LUPERINA Bdv.

Luperina niveivenosa Grt.

1879, Grt., Bull. Geol. Surv., v, 206. *Agrotis*.

Dull fusco-luteous, all the veins white marked. A black basal dash; another along hind margin. Basal half line obsolete. T. a. line marked only in submedian interspace, where it interrupts a broad black shade, which extends through the lower portion of this space to t. p. line; surmounting this dark shade is a clearer luteous shade. Orbicular narrow, oblique, pale; black-ringed. Reniform upright, outwardly indented, variable in size, black-ringed, with an interior pale annulus and concolorous center. A darker shade through the cell between the spots, and beyond the reniform the space is blackish to the t. p. line. This line is marked by a paler yellow shade, which is inwardly sharply defined, and outwardly merges into the ground color. S. t. line pale yellow, lunulate, interrupted forming an indefinite W, preceded by black, more or less sagittate spots, followed by smaller, less definite spots. Fringes usually paler at base. Secondaries pale fuscous, with paler fringes. Beneath, even pale fuscous, with a pearly luster. Head and thorax concolorous with the pale ground-color of primaries.

Expands 36 millimetres=1.45 inches.

HABITAT: Montana, Colorado.

No ♂ has been seen; four ♀♀—one of them, the type, has been under examination. The strongly white marked veins of primaries and the narrow oblique orbicular are distinctive. Mr. Grote evidently referred this species to *Agrotis* solely upon superficial appearance.

Luperina stipata Morr.1875. Morr. Pr. Ac. N. Sc. Phil. 1875, 64, *Hadena*.

Pale fuscous with usually a violet gray shading along the costal region. A black basal streak; a heavier streak on internal margin at base of t. a. line; and a broad black shade through submedian space between the ordinary lines. Median vein and its branches at end of cell, white to t. p. line. Sometimes veins 1 and 2 are powdered with white scales to the same point. Basal line obsolete; t. a. line marked only by a geminate oblique dusky shade in submedian space; t. p. line hardly marked superiorly, but distinct from vein four as a narrow pale line sharply limiting the dark shade in median space. S. t. line indefinite, marked by oblique dusky shades in terminal space and interrupted by paler streaks on veins three and four, reaching the outer margin. A series of black terminal lunules. Claviform very small, variable in size and shape. Orbicular concolorous, variably sized and formed, narrowly black ringed. Reniform indefinite, small, upright, constricted, resting on the white forks of the median vein. Secondaries pale ochery. Head and thorax concolorous with primaries, abdomen with secondaries. Beneath, very pale ochery in the ♀ darker. As a rule the ♀ is darker throughout than the ♂. The thorax is somewhat depressed, the anterior divided crest low and inconspicuous.

Expands 37 millimetres, 1.5 inches.

HABITAT.—Illinois, Massachusetts, Maine, Minnesota.

A very well marked species, recognizable by the white forks of median vein and the black transverse shade in median space.

Luperina passer Gn.

1852. Gn., Sp. Gen., Lep. Noct. I, 195, *Mamestra*.

1856. Walk., C. B. Mus. Lep. Het. IX, 231, *Mamestra*.

1879. Grt. Can. Ent., XI, 179, *Hadena*.

1882. Grt. New List, 27, *Luceria*.

loculata Morr.

1874. Morr, Bull. Buff. Soc. N. Sci. II, 110, *Luceria*.

1879. Grt., Can. Ent. XI, 179, pr. syn.

var *conspicua* Morr.

1874. Morr. Bull. Buff. Soc. N. Sci. II, 110, *Luceria*.

Pale leather brown, varying to smoky or gray brown, all the lines indistinct, geminate. T. a. line usually obsolete; outwardly angulated in the interspaces. T. p. line more evident, even or slightly crenulate, its course sinuate. S. t. line faint, marked usually by the slight difference in shade between terminal and s. t. spaces, and sometimes by more or less distinct black preceding spots. Claviform very distinct, heavily outlined in deep black. Ordinary spots concolorous; orbicular round, black ringed; reniform large, kidney shaped, more or less completely black-ringed, outwardly somewhat paler. The median space is usually somewhat darker, and there is a more or less evident dusky shade running parallel and rather close to t. p. line. Secondaries fuscous. Be-

neath fuscous, hardly powdery, with an indefinite common darker shade and discal spot. Head and thorax concolorous.

Expands 34 to 45 millimetres, 1.35 to 1.80 inches.

HABITAT.—Massachusetts, Connecticut, New York, Illinois, Colorado, Oregon.

Widely distributed and easily recognizable by the prominent black ringed claviform, the usually even, pale leather-brown color, and broad primaries with rather obtuse apex and rounded outer margin. The body is plump. The differences between the type and varietal forms have been already pointed out.

Luperina burgessi Morr.

1874. Morr., Buff. Bull. 2, 109, *Luceria*.

1875. Grt., Check List, Noct., *Hadena*.

1880. Grt., Bull. Bkln. Ent. Soc. III, 36, *Hadena*.

1882. Grt., New List, 27, *Luceria*.
discors Grt.

1881. Grt., Trans. Kans. Ac. Sci. VII, 65, *Hadena*.

Purplish, smoky brown, basal and s. t. spaces usually paler, often with a distinct carneous tint. Basal line well marked, geminate, black. T. a. line geminate, inner line faint, outer line distinct, black, outwardly bent and angulated between the veins, more prominently below submedian vein. T. p. line geminate, outer line faint, inner line distinct, dentate on veins, outwardly bent over cell, thence parallel to outer margin. S. t. line fine, narrow, interrupted, marked by yellowish scales forming a more or less evident **W**-mark, preceded by black sagittate marks and followed by black interspaceal lines reaching to the wavy outer margin. A narrow pale line at base of fringes. A fine black longitudinal line at base and another on inner margin near that point. Claviform rather small, black ringed, a black line from its apex to t. p. line. Orbicular large, oblique, black ringed, concolorous or with a carneous tinge. Reniform large, kidney shaped, outwardly pale, rather ind. finite, inwardly black margined. Secondaries white, with a very narrow dusky margin, widest in the ? . Beneath, primaries powdery, darkest toward apex; an interrupted outer line. Secondaries white, gray powdered toward costa where there is also a trace of the extra median line. Head and thorax concolorous, collar with a variably distinct black line.

Expands 39 to 41 millimetres, 1.60 to 1.65 inches.

HABITAT—Massachusetts (*Morr.*) Arizona, Nebraska.

We have seen no eastern specimens; those from the west agree perfectly with the description.

Luperina longula Grt.

1879. Grt., Bull. Geol. Surv., v, 204. *Hadena*.

Dark ash gray to smoky fuscous, with the maculation indistinct; transverse lines single. T. a. line irregularly dentate and angulate at

inner margin marked by the usual black dash. T. p. line outwardly bent over cell, with outward spurs on the veins making it crenulate. S. t. line pale, very indistinct, interrupted, the usual W-mark sometimes barely traceable, preceded by two black sagittate marks in the third and fourth interspace. A row of black terminal lunules. A black basal streak. Claviform variable in size and shape, usually incompletely outlined, suffused by a black shade that extends to the t. p. line. Ordinary spots large, faintly outlined; orbicular decumbent, elongate, oblique. Reniform upright, somewhat indented outwardly. Secondaries pale, smoky fuscous, lighter toward base. Beneath pale, powdery, with common outer line and discal dot. Head and thorax concolorous; collar somewhat paler inferiorly, patagiæ with a blackish shade near the dorsal margin. Abdomen with basal tuft only.

Expands 42 to 44 millimetres, 1.70 to 1.80 inches.

HABITAT.—Colorado, Nevada, Washington, and Kansas.

Closely allied to *burgessi* in habitus and pattern of ornamentation, but larger, broader-winged, more evenly gray, and with dusky secondaries.

In this, as in the preceding, the thoracic and basal tufts of abdomen are distinguishable and even well marked, yet they are loose, and the insects as a whole differ in habitus from their nearest allies among the *Hadena* proper.

Genus **XYLOPHASIA** Steph.

Group *vultuosa*.

The most obvious and distinctive character of this group is found in the peculiar maculation of the terminal and s. t. spaces. There are in the former two somewhat triangular dusky shades, the one with the tip near apex of wing and its base just above the middle of outer margin, the point extending inwardly a short distance into the s. t. space. The apex of the second dusky shade is close to the base of the first, and its broadest point is just within the hind angle, where also it crosses the s. t. line; that portion of this shade in s. t. space being often most prominent. The transverse maculation is more or less obsolete and punctiform, except in *remissa*, and the species are closely allied. The terminal darker shades above described are constant and form an obvious distinction. *Remissa* is a peculiarly intermediate form. It strongly resembles in maculation that series of which *indirecta* or *maetata* are typical, and it also has the broad wings of that series. It resembles *finitima* in ground color, the basal streak, and the structure of the δ genitalia, the clasper only being shorter and more slender. From all the others of the present group it differs by the distinct black shade connecting the median lines and by the large contrasting pale ordinary spots. The typical maculation of the s. t. space determines the reference of the insect to this group.

The remaining species agree in narrower wings, more or less obsolete or indistinct maculation, and indistinct and indefinite ordinary

spots, of which the reniform is usually more or less filled with black. There is no connecting shade between the median lines.

Illata, or as it is more commonly known, *suffusca*, is of a pale violet gray, with a reddish suffusion, which becomes darker and more intense toward costa. The maculation is obsoletely indicated, and the species easily recognizable. The tip of harpe is of the usual form, the spinulation along inner margin sparse. The clasper is much reduced in size, is cylindric and rather acutely terminated, and arises from the margin of the harpe just back of tip.

Vultuosa is more yellowish or reddish luteous, with the maculation more distinct, and with a black basal streak which separates it at once from the preceding. The harpe and tip of ♂ are as in *suffusca*, but the clasper does not arise from the margin, is stronger and somewhat curved.

Apamiformis is marked like *vultuosa*, but differs at once by the deeper, more chocolate-brown color. The genitalia are peculiar. The tip is much like that of the preceding species in shape, but the superior angle is very broadly rounded and excavated, and the greater part of the inner face of tip is rather densely clothed with coarse spinules. The clasper is very short, thick, straight, and obtuse, very different from the long slender form peculiar to most species of the genus.

In synoptic form the differences are as follows:

SYNOPSIS OF SPECIES.

Median lines connected by a black dash, ordinary spots large, distinct, contrasting	REMISSA
Median lines not so connected, ordinary spots not contrasting.	
No basal black streak.	
Violet or bluish-gray, with reddish suffusion, darker more distinct toward costa	ILLATA
A distinct black or brown basal streak.	
Reddish luteous, the costal region darker, reniform, narrow, constricted	VULTUOSA
More uniform, darker chocolate brown, reniform larger, outwardly white marked	APAMIFORMIS

Xylophasia remissa Hbn.

1812. Hbn., Noct., 423, *Noctua*.

1816. Hbn., Verzeichniss 219, *Astrapetis*.

1852. Gn. Sp. Gen., Noct. I, 208, an var. *Apamea gemina*.
indocilis Wlk.

1856. Wlk., C. B. Mus., Het. IX, 178, *Xylophasia*.

1882. Grt., Ill., Essay 44, pr. syn.

Luteous or livid gray, with a more or less evident deep red suffusion, median space darker above the black transverse shade. A black basal streak; another along hind margin to t. a. line. Basal line geminate, distinct. T. a. line outwardly arcuate, with short inward dents on veins, geminate, the inner line more or less obsolete, the included space

slightly paler. T. p. line outwardly bent over reniform and there more or less indistinct and punctiform, then nearly straight and better marked to hind margin. The outer portion of line is obsolete or marked only by venular points. S. t. line sinuate, marked only where the dark shades of terminal space above and below the middle cross it. A row of black terminal lunules. Claviform moderate, black ringed, a broad black shade extending from its inferior margin across the median space. Ordinary spots large, of pale ground color, contrasting with the darker setting, and more prominent by the blackish filling of the cell between them. Orbicular oval oblique. Reniform of normal form, the space from its outer margin to t. p. line of same pale color as the s. t. space beyond. Secondaries smoky fuscous, paler at base. Beneath, powdery with common line and discal spots; primaries with darker disc and broad pale outer margin. Head and thorax of ground color, patagiæ darker brown. Tuftings distinct.

Expands 35 to 40 millimetres, 1.40 to 1.60 inches.

HABITAT.—Middle and Eastern States, North Carolina.

The relationships of this species are elsewhere discussed.

Xylophasia illata Wlk.

1857. Wlk., C. B. Mus., Lep. Het. XI, 742, *Agrotis*.

1876. Grt., Can. Ent. VIII, 29, *Hadena*.

1877. Grt., Can. Ent. IX, 29, *Hadena*.

insignita || Wlk.

1857. Wlk., C. B. Mus., Lep. Het. x, 353, *Agrotis*.

1857. Wlk., C. B. Mus. Lep. Het. XI, 742, n. b. l.

suffusca Morr.

1875. Morr. Proc. Ac. N. Sci. Phil. 1875, 61, *Hadena*.

1877. Grt., Can. Ent. IX, 29 = *illata*.

Bluish gray with a more or less well marked reddish suffusion, always well marked along costal region. Median lines indistinct, punctiform or only faintly marked. Claviform obsolete, indicated only by a few ferruginous scales, or entirely wanting. Orbicular rather small, oval, oblique, with rusty outline, scarcely distinct. Reniform well sized, of ordinary form, black filled. S. t. line as is usual in the group, the preceding dark patch near hind angle unusually prominent: A row of black terminal lunules. Secondaries smoky, fuscous, paler toward base. Beneath dusky, powdery, with indistinct common discal line and spots. Head and thorax concolorous with primaries. Tuftings small but distinct.

Expands 37 to 41 millimetres=1.50 to 1.65 inches.

HABITAT.—Canada to Texas to Colorado.

The species is obscurely marked, and yet very recognizable by the bluish gray ground with reddish suffusion prominent toward costa, the reniform black filled and rather prominent.

Xylophasia vultuosa Grt.1875. Grt., Pr. Ac. Nat. Sci. Phil., 1875, 420, *Hadena*.

Somewhat reddish-luteous, becoming darker, more brownish toward costal region. A brownish black basal streak and another along hind margin to t. a. line, broader and better marked. Basal line geminate, marked in costa only. T. a. line geminate, more or less indistinct, outwardly arcuate, with inward dents on veins, that on vein 1 long and well marked, included space often white shaded below vein 1. T. p. line brown, lunulate, interrupted, often obsolete, followed by a series of geminate black venular dots, which when alone present are readily mistaken for the t. p. line itself. S. t. line marked only as usual in the group. A row of terminal black lunules. Veins white marked in s. t. space. A well marked brown median shade darkening the cell between stigmata and scalloped or lunulate below that point. Claviform very small, poorly marked. Orbicular narrow, elongate, pale, with brown central dot; reniform narrow, upright, constricted, more or less indefinite; a dusky central line. Secondaries blackish, fringes paler; beneath dusky, powdery, with distinct outer line and discal spot. Head and collar inferiorly concolorous with primaries. Thorax darker, patagiæ dark brown, with paler margin; dorsal tuft distinct and also paler.

Expands 37 to 41 millimetres, 1.50 to 1.65 inches.

HABITAT—Canada, New York, New Jersey, Wisconsin, Pennsylvania.

The ♀♀ are usually well marked and somewhat larger than the ♂♂ in which the color is usually paler, and the maculation through median space is often if not usually obsolete. The above description applies to well-marked ♀♀.

Xylophasia apamiformis Gn.1852. Gn., Sp. Gen. Noct. I., 137, *Xylophasia*.1856. Wlk., C. B. Mus. IX., 176, *Xylophasia*.1873. Grt., Buff. Bull. I., 109, *Hadena*.*contenta* Wlk.1856. Wlk., C. B. Mus. Lep. Het. IX., 233, *Mamestra*.

1863. Grt. and Rob., Trans. Am. Ent. Soc. II., 73, pr. syn.

Rather pale chocolate brown, usually even, more rarely powdered. The maculation is precisely as in *vultuosa*, except that the basal streak is less marked; the claviform, though small, is distinct, and the reniform is larger, black filled, and outwardly white marked. Secondaries smoky or blackish, paler at base, and with yellowish fringes. Beneath, powdery, with outer line and discal lunule; primaries with disc darker; costal and broad terminal space paler. Head and thorax concolorous, the tuftings distinct.

Expands 40 to 47 millimetres, 1.60 to 1.90 inches.

HABITAT—New York, New Jersey, Pennsylvania, and Illinois.

Closely allied to *vultuosa*, but obviously distinct by the much darker ground color and the differently shaped reniform.

The reference of *contenta* Wlk. to this species can not be accepted as final, since Mr. Grote has more recently referred it to *devastatrix* as a synonym of that species.

Group *finitima*.

The distinguishing feature of this group is found in the obsolescence of the s. t. line, the distinctly defined usually darker median space, and single or obsoletely geminate median lines. The ordinary spots are distinct in all the species, though not always well defined. The terminal space is either concolorous or only slightly darker, and the s. t. space contains no prominent spots or shades, the darkening toward costa excepted.

Two of the species are very rare; one thus far known only in the ♀ sex, and only one specimen at that; the other known in both sexes, but only single specimens of each.

Exornata is a rusty or somewhat paler red-brown species, with dark powderings, distinct single median lines and somewhat indefinite ordinary spots. The ♂ genitalia are of the usual type, the clasper stout, and reaching to the end of tip. The ♂ type is from Labrador; the only ♀ seen, from Colorado.

Hulstii is a very strongly marked species. The color is rather pale, clear luteous, the superior part of median space dark red brown, the large reniform paler and contrasting. The ♀ only is known.

Finitima, which I believe is only a local variety of the European *basilinea*, differs from both the preceding by the distinct black basal streak, and the black-ringed ordinary spots. The median space is reddish brown, the remainder of wing a somewhat livid or violet gray. The genitalia of the ♂ are like those of *exornata*, but the clasper is still thicker, and there is a dense clothing of small spinules along inner margin to the superior angle. Speyer has pointed out the only observable differences between the European and American forms of this species, which simply amount to a somewhat clearer, more definitely cut, ornamentation of the American race. The tuftings in this species are well marked, as they are also in *exornata*. The ♀ *Hulstii* is somewhat imperfect, but in this species also they will probably be found moderately prominent.

In synoptic form the differences appear thus:

No basal black streak.

Color of median space even. Rusty or red brown with darker powderings.. EXORNATA

Median space much darker superiorly, the reniform pale and contrasting

ground color pale clear luteous.....HULSTII

A distinct black basal streak, ground color livid, somewhat violet gray,

median space darker, the maculation distinct.....FINITIMA

Proc. N. M. 90—27

Xylophasia exornata Moeschl.1864. Moeschl, Wien. Ent. Monatschr. iv, 364, pl. 9, f. 5, *Hadena*.1867. Pack., Proc. Bost. Soc. N. H. xi, 39, *Hadena*.

Rusty reddish brown, median space rather strongly, rest of wing sparsely black powdered. Median lines distinct, single. T. a. line upright, with an outward curve in submedian interspace. T. p. line with outward points on veins; outwardly bent over cell, incurved below. Basal line indistinct. S. t. line obsolete, traceable by a difference in shade between s. t. and terminal spaces, but not otherwise. The s. t. space is lighter than other portions of wing, except toward costa, where it is more heavily black powdered. Claviform very small or entirely wanting. Ordinary spots rather large, paler, indefinite. Secondaries blackish or smoky fuscous, fringes paler. Beneath smoky, powdery, with indefinite outer line; secondaries with discal lunule. Head and thorax concolorous with primaries, the tuftings not prominent.

Expands 33 to 40 millimetres, 1.32 to 1.60 inches.

HABITAT—Labrador, Colorado.

The kindness of Mr. Moeschler has enabled me to examine the ♂ type. A ♀ specimen from Mr. Graef's collection is from Colorado. It is somewhat more sordid in appearance than the Labrador ♂ and is smaller, but unquestionably is the same species. The distribution is interesting, and intervening points ought to yield the same species. The ♀ from Colorado has an *anartiform* appearance not noted in the ♂, and caused by the imperfect condition of the example. The vestiture is largely hairy.

Xylophasia hulstii Grt.1880. Grt. N. Am. Ent. i. 93, *Hadena*.

Ground color a somewhat clear bright luteous with sparse carmine powderings; superior portion of median space dark brown, inferior portion contrasting, whitish. Basal space, dark powdered in costa; s. t. space with a broad, rather carmine shaded, dark costal patch. Basal line geminate, red brown, distinct. T. a. outwardly oblique, curved between veins, brown; geminate at middle, the inner line formed of red brown scales. T. p. line simple, nearly parallel with outer margin, with outward dents on veins. S. t. line marked at inception by the dark patch in s. t. space and the pale apex, barely traceable through the rest of its course by a sparse powdering of deep red-brown scales, and the darker powdering in terminal space. A row of black terminal lunules. Claviform moderately long, narrow, rusty. Orbicular moderate, ovate, oblique, rusty ringed, with a sparse powdering of white scales. Reniform large, kidney shaped, contrasting whitish, except where invaded by the ferruginous transverse shade which fills the cell between the spots and forms an angle below reniform, running thence close to and parallel with t. p. line. Secondaries ochrey fuscous, powdery; a faint discal lunule.

Beneath, primaries with blackish disc and broad, pale terminal space; secondaries pale ochreous, with brown powderings, outer shade line and discal spot.

Expands 40 millimetres = 1.60 inches.

HABITAT.—Colorado.

The unique ♀ type from Mr. Hulst's collection was before me. The species is so well marked that there is no possibility of mistaking it.*

Xylophasia finitima Gn.

1852. Gn., Sp. Gen. Noct. 1, 206, *Apamea*.

1856. Wlk., C. B. Mus., Lep. Het. IX, 250, *Apamea*.

1875. Speyer, Stet. Ent. Zeit. 1875, 150, an var. *basilinea*.

1878. Graef, Bull. Bkln. Ent. Soc. 1, 9, an var. *basilinea*.

1882. Grt., New List 1882, *Hadena*.

Pale, livid, or somewhat violet gray, the median space more red brown, a slight crimson suffusion in costal region of basal space, and a larger, darker shade fills the costal region of the s. t. space. Terminal space somewhat darker gray; a distinct black basal streak. Basal half line geminate, faint. T. a. line geminate, inner line more or less obsolete, outer line blackish, darker toward inner margin; its course outwardly arcuate. T. p. line geminate, black, outer line punctiform or obsolete; somewhat outwardly bent over cell, and with a small inward line to hind margin. S. t. line faintly marked by a slight difference in shade between s. t. and terminal spaces: a row of black terminal lunules. Claviform small, black ringed. Ordinary spots large, black ringed; orbicular oblique, often with a narrow white interior annulus; reniform, with broader distinct white annulus, inferiorly with black powdery filling. Secondaries smoky fuscous, paler toward base; a row of black terminal lunules. Beneath powdery, disc of primaries dusky, outer margin broadly pale; secondaries paler, with median transverse darker line; both wings with darker discal spots. Head and thorax concolorous with primaries, the tuftings distinct; dorsal tuftings of abdomen distinct.

Expands 36 to 39 millimeters = 1.44 to 1.76 inches.

HABITAT.—Middle and Eastern States, Canada, Colorado.

The European examples differ from the American variety by less definite maculation and more even and less contrasting color. Still I think there is no question as to their specific identity, though the name *finitima* may be retained as applying to our American race.

Group *sputatrix*.

In this group all the maculation becomes indistinct or obsolete, the ground color is even, and there is no contrast except in the reniform, which is more or less white or pale powdered. In structure the species do not differ from the *devastatrix* group.

* Mr. Bruce sent me in February, 1891, a single specimen in a lot for determination. The maculation is like the type but the colors are more sordid throughout.

Lateritia, or, as it is generally named, *dubitans*, is reddish brown, and recalls somewhat some species of the *cariosa* group (*genialis*); but differs evidently. The primaries are proportionately somewhat longer and less obtuse than in the other members of the group. The harpes and tip of ♂ are of the usual form, the interior edge somewhat sparsely spinulated. The clasper is distinct, rather stout, and reaches rather more than half way to the end of tip.

Cogitata closely resembles *lateritia* and is generally confused with it. It differs at sight in the more obtuse primaries and more discolored reniform, but otherwise the markings are very like its ally. The genitalia are quite distinctive; the clasper is much longer than in *lateritia*, and there is a supplemental process at the base of the long hook.

Sputatrix differs evidently from *lateritia* not only in color, but in the more obtuse primaries. The ground color is dark blackish brown, the median lines obsolete, and only the strongly pale marked reniform prominent. The tip of harpes is much as in *lateritia*; but the clasper is much longer and rather more slender. There is also an additional small, slender, curved, chitinous hook at about the middle of the harpe.

Plutonia is smaller than either of the preceding, as dark as *sputatrix*, but with the reniform only narrowly pale marked outwardly, and a distinct black streak along internal margin near base. The tip of ♂ harpes is distinctive and rather peculiar. The outer margin is somewhat rounded, the superior margin broadly lobed, and furnished with a brush of hair; the inner margin has a narrow series of spinules nearly to the junction with main shank of the harpe, and here there is a tuft of divergent spinules. The clasper is short and straight, arising from inferior margin of side piece close to tip.

The differences are sufficiently noted without again giving them in synoptic form.

Xylophasia lateritia Hufn.

1767. Hfn., Berl. Mag. III, 306, *Noctua*.
 1816. Hub., Verzeichniss 243, *Septis*.
 1852. Gn., Sp. Gen. Noct. I, 137, *Xylophasia*.
 1857. Wlk., C. B. Mus. Lep. Het. x, 170, *Xylophasia*.
 1874. Grt., Can. Ent. VI, 215, *Hadena*.
molochina Hbn.
 1812. Hbn., Samml. Noct. 74, *Noctua*.
 1816. Hbn., Verzeichniss 243, pr. syn.
insignita Wlk.
 1857. Wlk., C. B. Mus. Lep. Het. XI, 729, *Apamea*.
 1868. Grt. and Rob., Trans. Am. Ent. Soc. II, 78, pr. syn.
 1873. Grt., Buff. Bull. I, 108, pr. syn.
dubitans Wlk.
 1857. Wlk., C. B. Mus. Lep. Het. IX, 232 *Mamestra*.
 1873. Grt., Buff. Bull. I, 108, *Hadena*.
 1874. Speyer, Stell. Ent. Zeit. 446, an var *lateritia*.
 1874. Grt., Can. Ent. VI, 215 = *lateritia*.

Yellowish red, or leather brown, with sparse white powderings, more obvious in orbicular, and distinct in reniform, which is outwardly white.

marked. Lines obsolete or faintly marked. T. a. line strongly dentate between veins. T. p. line crenulate, parallel with outer margin. S. t. line very indefinite, irregularly sinuate and dentate, often punctiform, rarely with darker preceding shade. Orbicular oval, indefinite; reniform large white powdered, outwardly with a broad lunate white defining mark. Secondaries pale smoky fuscous, darker outwardly, fringes reddish. Beneath reddish or fuscous, more or less powdery, with a variably distinct outer line and discal spot. Head and thorax concolorous with primaries; tuftings small but obvious, not very distinctly marked.

Expands 37 to 50 millimetres; 1.5 to 2 inches.

HABITAT.—United States and Europe.

Widely distributed and fairly common everywhere. The European specimens are as a rule paler and more evidently white powdered, but there are specimens from our fauna agreeing perfectly with those from Europe. There is no difficulty in identifying the species.

Xylophasia cogitata Smith, sp. nov.

Head, thorax and primaries brick red, the former immaculate. Primaries with all the transverse maculation faint, yet all traceable. Basal line vague, narrow, pale. T. a. line pale, upright, but slightly angulate, scarcely defined. T. p. line faint, pale, evenly outcurved. S. t. line white, well marked at inception, but becoming lost beyond the middle, its course but slightly and irregularly sinuate. A vague but traceable darker red median shade. Claviform small, indefinitely outlined in darker red. Orbicular small, oval, oblique white ringed. Reniform large blotchy white, not completely defined. Secondaries fuscous, with a reddish suffusion, a lunulate marginal line, fringes more carneous; a faint discal line and lunule. Beneath paler, powdery, with an outer line and discal dots on all wings.

Expanse 1.60 to 1.64 inches; 40 to 41 millimetres.

HABITAT.—Sierra Nevada California, Colorado.

This species has probably been confused in collections with *lateritia*, which it closely resembles in habitus, but from which it differs very obviously in wing form, the primaries being much shorter and more obtuse. The orbicular is more distinct, the reniform more blotchy; but otherwise the maculation seems identical. The genital structure, however, is very distinctive and well emphasizes the character given by the wing form.

It is not impossible that the distribution is considerably wider than above given, and, in the light of later experiences it may not be improbable that our eastern form is not the same as the European species. This I can not determine now, from lack of material.

Xylophasia morna Strk.

1879. Strk., Rept. Chief Eng., 1878-'79, v, p. 1861, *Hadena*.

“♂ Expands $1\frac{3}{4}$ inches. Head and thorax cinnamon colored. Abdomen of same color, but paler.

“Upper surface of primaries same color as head and thorax; darkest from discal spot inward; markings all more or less indistinct. T. a. line deeper reddish and double. T. p. line apparently single. Reniform indistinct, its lower part on the median nervule filled with a gray or lead-colored spot, which is the only mark of any prominence. Exterior margin of wing bordered with a dark shade; fringe same color as the last. Secondaries reddish white, with broad smoky border exteriorly; fringe pale.

“Under surface primaries shining cinnamon color, paler than above but devoid of dark border.

“One male at Rio Blanco, near its headwaters.”

I have seen nothing that agrees with the above description, but it would seem to be related to *lateritia*, or more particularly *cogitata*, from which, however, it differs obviously.

Xylophasia sputatrix Grt.

1873. Grt., Buff. Bull. 1, 190, *Hadena sputator*.

insignita Wlk.

1857. Wlk., C. B. Mus. Lep. Het. XI, 729, *Apamea*.

1873. Grt., Buff. Bull. 1, 190, n. b. 1.

Blackish deep brown, rarely with a more reddish brown shade through center of wing. Median lines obsolete. S. t. line punctiform, the spots consisting of scattered yellowish scales, a more or less obvious black preceding shade. Claviform small; traceable. Orbicular moderate; oval, often obsolete, sometimes white powdered. Reniform pale powdered, its outer portion pale, blotchy, forming a distinct contrast to the dead black brown of the rest of the wing. Secondaries smoky fuscous, with pale yellowish or pinkish fringes. Beneath with reddish and black powderings. Primaries with paler terminal space; secondaries with distinct line and discal spot. Head and thorax concolorous with primaries; tuftings small. Abdominal tuftings distinct.

Expands 40 to 43 millimetres, 1.60 to 1.70 inches.

HABITAT.—Eastern, Middle, and Northern States; Canada.

Readily distinguished by the dull blackish brown color, the maculation obsolete, and the reniform contrastingly pale marked. It is not uncommon.

Xylophasia plutonia Grt.

1883. Grt., Can. Ent. xv, 9, *Hadena*.

Blackish brown, a paler shade at base, and less distinct beyond reniform to t. p. line. A distinct deep black streak along inner margin near base. Median lines obsolete. S. t. line a series of elongate black

spots. A row of terminal darker lunules. Orbicular indistinct, but traceable, elongate, oblique. Reniform large, upright, somewhat constricted at middle, with a few white scales along outer margin. Secondaries smoky; fringes paler, more yellowish. Beneath blackish, powdery; secondaries with distinct outer line and discal spot. Head and thorax concolorous with primaries; tuftings distinct; yellowish.

Expands 37 millimetres; 1.5 inches.

HABITAT.—Maine, Minnesota.

The unique type is from Mr. Thaxter. The species is nearest to *sputatrix*, but is smaller, lacks the contrasting pale markings of reniform, and has a black streak along inner margin near base.

[Since the above has been in the hands of the printer, Dr. O. Lugger has sent me a specimen for determination, taken at St. Anthony Park, Minn. It agrees perfectly with the Maine specimen.]

Group *alticola*.

This group is established for a single species, rather aberrant in habitus, but most nearly related to the *devastatrix* series, differing by the lack of the spots preceding the s. t. line. The latter is even and distinct. The claviform is wanting, there is no connecting dash, no basal dash, and there are no contrasts in color throughout the wing. Altogether the species is recognizable and easily distinguished.

Xylophasia alticola Smith, sp. nov.

Head and thorax ashen gray, with more blackish admixed scales. Primaries paler, powdery, with an admixture of yellowish green, all the maculation distinct. Basal line white, not definite. T. a. line black, with a preceding white line, outwardly oblique to submedian interspace, then with a broad inward tooth on internal vein. T. p. line nearly parallel with outer margin, regularly dentate, black followed by a white line. S. t. line white, sinuate, and small W mark at middle. An interrupted blackish terminal line; fringes cut with white. A vague, dusky, median shade. Orbicular rounded, not defined, small, white. Reniform upright, moderate in size, white ringed, center concolorous. Secondaries evenly fuscous, fringes white. Beneath pale, powdery, with a common outer line and a discal spot on all wings.

Expands 1.45 inches, 36 millimetres.

HABITAT.—Gibson Mountains, Colorado, 12,500 feet.

A single male specimen collected by Mr. Bruce is before me. The species differs prominently from all the described species, and has no close allies in the genus. There is a vague suggestion of *devastatrix* in the habitus, and perhaps to this species it may be most nearly related. The greenish shade is not localized, but is rather more prominent in the basal and s. t. spaces.

Group *devastatrix*.

This group differs from the preceding (*sputatrix*), by the less prominent tuftings, more even outer margin of primaries, the inner angle not retracted, and most obviously by the fact that the terminal space is never darker, but rather paler than the s. t. space, and except in *sommeri* the s. t. space is not paler than the median space. The s. t. line in all the species is preceded by a series of sagittate dashes, which are sometimes confluent, but always present. The genitalia of two of the species are unknown, but as the others, their near relatives, agree very well in this point with the other typical groups, they will probably not present anything very peculiar.

Ducta, of which *separans* is a synonym, is nearest to the *arctica* group by the tuftings, which, though perhaps less prominent, are like those of that group. Is a dusky, blackish species and is easily recognized by the small but distinct **W** mark of the s. t. line. The ♂ has not been examined.

Impulsa is a somewhat purplish black species, with deep, velvety black markings and yellow punctiform s. t. line. There is no difficulty in its recognition. The outer margin of tip of ♂ harpes is somewhat rounded, and as usual, with a fringe of spinules. At the inferior angle there is a brush of longer spines extending half way to the superior angle, which is rather broad, and as usual, excavated. The clasper reaches to the end of tip and is slender, somewhat twisted. Inside of this is a shorter, slender, chitinous process somewhat enlarged toward tip.

Devastatrix, the type of the group, has the tuftings much reduced in size, and there is a strong suggestion of the *Luperina* group in its general habitus. It varies from pale to blackish gray; the median lines are rather even, geminate, the included space pale in dark specimens. S. t. line also rather even, and the sagittate preceding dashes are more or less confluent. The genitalia are essentially like those of *impulsa*, except that the superior angle is somewhat narrowly prolonged. The clasper is not so long and perceptibly stouter. Altogether, though variable, the species is well marked and easily recognizable.

Exulis is a northern form and exceedingly variable. It is luteous or rust brown, with blackish or darker powderings, and the veins and ordinary spots, usually white marked. Often the white powderings extend to other parts of the wing, and often the transverse lines are accompanied by white shades. From all others in this group it is easily distinguished by the ground color. The tip of ♂ harpe differs from the others in the group by having the brush of spines at inferior angle extending along the inferior margin to the superior angle, which is broadly rounded and, as usual, excavated.

Sommeri is also a northern species, differing from all others in the group by the darker median space, though agreeing in other features. In the two last named species the tuftings are distinct; more so than in *devastatrix*; less so than in *ducta* and *impulsa*. No ♂ of this has been examined.

SYNOPSIS OF SPECIES.

A distinct **W** mark in s. t. line; blackish gray, tuftings very prominent.DUCTA
No **W** mark in s. t. line.

Purplish black; markings velvety black.IMPULSA

Ash gray or darker; t. p. line even, or but little dentate.DEVASTATRIX

T. p. line distinctly dentate and crenate.

Luteous or rusty brown, with black and white powderings, the latter most prominent on the veins.EXULIS

Median space luteous brown, otherwise gray or paler.SOMMERI

Xylophasia ducta Grt.

1878. Grt., Bull. U. S. Geol. Surv. iv 176, *Hadena*.
separans Grt.

1880. Grt., Bull. U. S. Geol. Surv. vi 260, *Hadena*.

Blackish, or smoky fuscous, the lines black. Basal line geminate, rather indistinct, resting on a small longitudinal black mark; a similar small black dash at internal margin, often obsolete. T. a. line outwardly curved between veins; inner portion of the line obsolete. T. p. line dentate or crenulate on veins, outwardly curved over cell, and with an inward curve below that point. S. t. line whitish, often interrupted, and more or less punctiform; forming a distinct, though small, **W** on veins 3 and 4; preceded by black sagittate dashes in interspaces, and followed by more or less distinct similar marks connecting with a series of small terminal dots. Claviform concolorous, black-ringed, variable in size, and often connected with t. p. line by a blackish shade. Ordinary spots large, narrowly black ringed, slightly paler; reniform, with a series of white scales near outer margin. Secondaries blackish gray, paler at base; a dusky discal spot. Beneath blackish, powdery, with outer line and discal spot. Head and thorax concolorous, with primaries; palpi white marked.

Expands 40 to 42 millimetres, 1.60 to 1.68 inches.

HABITAT: New York, Wisconsin, Maine, Washington.

Rather widely distributed, but not common. No ♂ has been obtainable for dissection, though we have seen that sex. Mr. Grote's *separans* was based on a pale specimen, with a more than usual resemblance to *devastatrix*.

Xylophasia impulsa Gn. .

1852. Gn., Sp. Gen. Noct. 1, 194, *Mamestra*.

1856. Wlk., C. B. Mus. Lep. Het., ix, 231, *Mamestra*.

1873. Grt., Buff. Bull. 1, 108, *Hadena*.

r. mixta Grt.

1880. Grt., Bull. U. S. Geol. Surv. vi, 264.

Black, with a purplish tinge, the markings intense, velvety black, the lines geminate. Basal line distinct, joining a short basal streak. T. a. line outwardly oblique or arcuate, curved between veins, inner line less distinct except at hind margin, where it joins a deep black streak toward base. T. p. line bisinuate, the inner line lunulate, the outer less

distinct and very even. T. p. line, consisting of a series of yellow points preceded by black sagittate marks. Claviform small, black ringed. Orbicular moderate, oval oblique. Reniform large, kidney-shaped, outwardly with some pale powderings. A distinct median shade oblique from costa between the ordinary spots nearly to t. p. line; then close to and parallel with that line to hind margin. Secondaries smoky black, paler toward base. Beneath purplish black, powdery, with distinct outer line and discal spots. Head and thorax concolorous with primaries; tuftings prominent.

Expands 35 to 42 millimetres=1.40 to 1.70 inches.

HABITAT.—Eastern and Middle States, Texas.

Of the variety *mixta* Mr. Grote says: "the pale powderings are more noticeable, the claviform rounded, all the lines narrower and more distinct, the reniform powdered with whitish." It is from Texas, and has not been seen by me.

Xylophasia devastatrix Brace.

1819. Brace, Am. Journ. Sci. I, 154, *Phalæna*.
 1862. Harris, Inj. Ins., Flint ed., 445, *Agrotis*.
 1869. Riley, 1st Rept. Ins. Mo., 83, *Agrotis*.
 1873. Grt., Buff. Bull. I, 108, *Hadena*.
 1875. Speyer, Stett. Ent. Zeit. 36, 147, *Hadena*.
 1878. Grt., Bull. U. S. Geol. Surv. IV., 178, *Hadena*.
 1881. Riley, Suppl. and Gen. Index to Mo. Repts., 56, *Hadena*.
 1883. Saunders, Fruit Ins. 329, pp. 341, 342, *Hadena*.
 ordinaria Wlk.
 1856. Wlk., C. B. Mus. Lep. Het. IX, 232, *Mamestra*.
 1868. Grt. & Rob., Trans. Am. Ent. Soc. II, 77 pr. syn.
 1877. Grt., Can. Ent. IX, 128 pr. syn.
 1882. Grt., Ill. Essay, 43 pr. syn.
 contenta Wlk.
 1856. Wlk., C. B. Mus. Lep. Het. IX, 233, *Mamestra*.
 1882. Grt., Ill. Essay, 43 pr. syn.
 abjecta var. † Gn
 1852. Gn. Sp. Gen. Noct. I, 194, *Mamestra*.
 1875. Speyer, Stett. Ent. Zeit. 36, 147, *Hadena*.

Luteous to ash, to blackish gray, markings black or blackish. A small basal streak, and another at hind margin near base. Basal half line usually distinct, geminate. T. a. line outwardly oblique, sometimes arcuate, curved between veins; distinctly geminate. T. p. line geminate, the included space paler; outwardly curved over all cell, thence inwardly oblique to margin, its course rather even; only slightly dentate on veins. S. t. line pale, sometimes more or less punctiform; tolerably even except at apex, where it bends abruptly inward; preceded by a series of dark or black sagittate spots, which are sometimes more or less confluent. A row of dark or black terminal lunules. A distinct median shade between ordinary spots, and then near to and parallel with t. p. line, sometimes connected with it by a dark shade opposite claviform. Claviform small, black ringed, sometimes with a dusky shade. Orbicular variable in size and form, dark ringed, sometimes

with a yellowish suffusion. Reniform large, upright, centrally constricted, black ringed, annulate, with white or yellow scales. Secondaries fuscous or smoky, darkest outwardly; a distinct discal lunule. Beneath variable in shade, powdery, with variably distinct outer lines and discal spots.

Expands, 35 to 46 millimetres=1.40 to 1.75 inches.

HABITAT.—United States and Canada.

A common and widely distributed form, varying greatly in every respect, and yet retaining a peculiar habitus that to the student betrays the species at a glance. The eastern specimens are, as a rule, more sordid and more evenly gray, while specimens from the Pacific slope show more contrast in color and the maculation is more sharply defined. Occasionally a specimen is found that is blackish throughout and leaves the lines visible by their paier included spaces; and one specimen before me is blackish, except for the median space. The tuftings are not prominent, and the species shows a decided relationship to the *Luperina* group of the genus.

The bibliography is far from complete, all the economic references being omitted. The species is, in the larva state, one of the most common and destructive cut worms, and the life history has been written frequently.

Xylophasia exulis Lef.

1836. Lef., Ann. Soc. Ent. Fr. v, 391, pl. 10, p. 1, *Hadena*.
 1852. Gn., Sp. Gen. Noct. 1, 185, *Crymodes*.
 1856. Wlk., C. B. Mus. Lep. Het. IX, 220, *Crymodes*.
gelata Lef.
 1836. Lef., Ann. Soc. Ent. Fr. v, 393, pl. 10, p. 30, *Hadena*.
 1852. Gn., Sp. Gen. Noct. 1, 185, *Crymodes*.
 1856. Wlk., C. B. Mus. Lep. Het. IX, 220 *Crymodes*.
grænlandica Zett.
 1839. Zett. Ins. Lap. 939, *Hadena*.
 1845. H. Sch., Schmett. Eur. II, 274, 284, pl. 31, p. 151, *Polia*.
 1852. Gn., Sp. Gn. Noct. 1, 185, *Crymodes*.
 1856. Wlk., C. B. Mus. Lep. Het. IX, 219, *Crymodes*.
cervina Germ.
 1844. Germ., Fn. Ins. Eur. 22, No. 19.
marmorata Zett.
 1839. Zett. Ins. Lap., 937, *Hadena*.
 1845. H. S., Schmett. Eur. II, pl. 451, *Polia*.
 1856. Wlk., C. B. Mus. Lep. Het. IX, 220=*poli*.
diffusa Geyer.
 1837. Geyer, Zutr. Hüb. Saml. Ex. 9, ff. 821, 822, *Exarnis*.
 1871. Staud. Cat. Lep., 100=*exulis*.
 1881. Grt., Can. Ent. XIII, 91=*exulis*.
gelida Gn.
 1852. Gu., Sp. Gn. Noct. 1, 186, pl. IV, p. 7, *Crymodes*.
 1856. Wlk., C. B. Mus. Lep. Het. IX, 221, *Crymodes*.
poli Gn.
 1852. Gn., Sp. Gen. Noct. 1, 187, *Crymodes*.
 1856. Wlk., C. B. Mus. Lep. Het. IX, 220, *Crymodes*.
borea Gn.
 1852. Gn., Sp. Gen. Noct. 1, 186, *Crymodes*.

Reddish or luteo fuscous, more or less black powdered, veins often and sometimes wing generally, with white powderings. A small black basal streak and a more prominent shade along internal margin at termination of t. a. line. Basal line variably distinct, geminate, included space usually paler. T. a. line outwardly oblique, curved between veins; sometimes obsolete, sometimes preceded by a pale shade. T. p. line about parallel with outer margin, dentate on veins, followed by white points. S. t. line pale, irregular, sometimes with an indistinct **W** mark, preceded by a series of more or less confluent blackish sagittate spots. A row of black terminal lunules. A broad variably distinct median shade darkens the cell between the ordinary spots, then runs rigidly oblique, and moderately close to t. p. line to hind margin. Claviform variable in size and shape; sometimes small, rounded, and again extending nearly across the median space. Orbicular oblong or oval, oblique, moderate in size, more or less white powdered. Reniform large, upright, variable in shape, with broad white powdery annulus and powdery brown center; secondaries fuscous, with paler, more yellowish fringes. Beneath paler than above, powdery, with variably distinct outer lines and discal dots. Head and thorax concolorous with primaries. Tuftings distinct but not prominent.

Expands 35 to 43 millimetres, 1.40 to 1.72 inches.

HABITAT.—Labrador, Greenland, Iceland.

The synonymy of this species sufficiently indicates its variability, but recognizing this, there is no difficulty in identifying the species, since it offers obvious differences from all the preceding.

For a fuller bibliography and for the authority for the synonymic references the student should consult Staudinger's Catalogue, which I have followed in this respect, and Walker's List and descriptions in the British Museum Catalogue. Nearly all the forms are credited to Labrador, and the species is not common in collections.

Xylophasia sommeri Lef.

1836. Lef. Ann. Soc. Ent. Fr. v, 391, pl. 10, f. 1, *Hadena*.

1852. Gn., Sp. Gen. Noct. 1, 187, *Crymodes*.

1856. Wlk., C. B. Mus. Lep. Het. ix, 220, *Crymodes*.

Paler grayish fuscous, the median space darker fuscous brown. Basal line geminate, distinct, included space pale, t. a. line outwardly curved between veins; geminate, the inner line obsolete, outer line black, included space pale, t. p. line obsoletly geminate, the outer line indistinct, included space pale, widely projected outwardly over the cell, dentate on veins, then with an inward curve to hind margin. S. t. line pale, distinct, sinuate, and in veins three and four dentate, preceded by fuscous, more or less sagittate spots. A paler shade at base of fringes, in which is a row of small terminal black dots. A rather faint median shade line between the ordinary spots and then close to t. p. line to inner margin. Claviform rather large, extending nearly across

the median space; concolorous, black ringed. Orbicular large, oval, oblique, pale. Reniform large, upright, pale, with fuscous inner line and powderings. Secondaries pale fuscous, darker outwardly, with a distinct dusky line. Beneath pale, powdery, with outer line and discal dot. Head and thorax concolorous, tuftings distinct.

Expands 40 millimetres = 1.60 inches.

HABITAT.—Labrador, Greenland, Iceland.

I have seen the ♀ only, and the insect seems rare. The dusky median space allies the insect to the preceding section, but the pale terminal space and punctiform or broken shade preceding the s. t. line are characteristic of the present group. It is not improbable that this is also a form of *exulis*.

Group *arctica*.

The species of this group are of large size; robust, with apices of primaries well marked, fringes slightly but perceptibly scalloped, hind angles somewhat retracted, and abdomen elongate and conic. The thoracic tufts are dense, the anterior divided crest not prominent, but the basal tufts very well marked; the abdominal tufts are prominent. They agree in essential features of maculation, the s. t. space being rather paler, sometimes contrasting and the terminal space uniformly darker. The reniform is always more or less white marked, and the general resemblance to *arctica* is obvious at a glance in all the species save *occidens*, which, however, is not likely to be referred elsewhere even though somewhat aberrant in color.

The genitalia of those species of which the males are known are of the normal *Hadenoid* type, though differing in detail.

Arctica is so well known that it scarcely requires description, the deep red-brown median space and contrasting blue-gray s. t. space are characteristic. The outer margin of tip of male harpe is densely fringed with spinules, and the inner inferior angle has a small brush of smaller spines continued sparsely along the inner margin and more dense near the superior angle, which is narrow. The clasper is slender, extending to the end of the tip.

Albina replaces the deep red brown by a more yellowish brown, and the s. t. space is still more yellowish, with a bluish-white shade opposite hind angle. The s. t. line is yellowish, and has a distinct though not prominent **W** mark on veins three and four, not so marked however to cause any doubt as to which group it should be referred. The tip of male harpe is smaller, the outer margin less rounded, and the brush of spinules at the inner inferior angle larger and more dense. The superior angle is rather broad and deeply excavated, the clasper moderate, and reaching to end of harpe. The species is well distinguished from *castanea*, to which Mr. Grote had referred it.

Castanea is darker, more evenly colored than either of the preceding, and the s. t. space is but little paler. The terminal space is darker,

however, and the reniform is white marked. The tip of male harpe is very like that of *arctica*, and the arrangement of spinules is similar, the superior angle is somewhat drawn out and ladle shaped. The clasper is very long and slender, extending beyond the end of tip.

Occidens, with an obvious agreement of essential characters, is pale gray in color, and the t. p. line is strongly retracted below the reniform. Mr. Grote says that some specimens have the median space brownish, and that the resemblance to *arctica* is obvious, but no such specimens have been seen by me. The ♂ has not been examined.

SYNOPSIS OF SPECIES.

Deep red brown median space, and contrasting pale blue-gray s. t. space....	ARCTICA
Yellowish brown, s. t. space paler, blue gray only opposite hind angles, a small W mark in s. t. line.....	ALBINA
More evenly dark brown, s. t. space but little paler, s. t. line evenly sinuate.....	CASTANEA
Pale ash gray, t. p. line strongly retracted below reniform	OCCIDENS

Xylophasia arctica Bdv.

1840. Bdv., Gen. et Ind. Meth. 120, *Hadena*.
 1845. H. S. Schmett, Eur. II, 272, pl. 31, f. 155, *Polia*.
 1852. Gn., Sp. Gen. Noct. II, 193, *Mamestra*.
 1856. Wlk., C. B. Mus. Lep. Het. IX, 225, *Mamestra*.
 1869. Minot, Can. Ent. II, 28, *Mamestra*.
 1870. Saund., Can. Ent. II, 75, *Mamestra*.
 1874. Grt., Buff. Bull. II, 14, *Hadena*.
amputatrix Fitch.
 1856. Fitch, 3d Rept. Ins. N. Y., 425, *Hadena*.
 1869. Riley, 1st Rept. Ins. Mo., 37, *Hadena*.
 1873. Grt. Buff. Bull. I, 108, pr. syn.
amica Harr.
 1862. Harr., Inj. Ins., Flint ed., 450, f. 222, *Hadena*.
 1873. Grt., Proc. Bost. Soc. N. H. XVI, 241, pr. syn.

Deep purplish or carmine red, basal and s. t. spaces more or less bluish gray; terminal space darker, more blackish. Basal line present, geminate. T. a. geminate, dentate on veins; t. p. line crenate, obsoletely geminate, sinuate; s. t. line pale, irregularly sinuate, preceded by a rusty-brown shade. Apex pale powdered. A row of small dark terminal dots. A pale line at base of fringes. A faint median line between the ordinary spots. Claviform concolorous, very faintly marked. Orbicular oval, somewhat oblique, more or less pale powdered. Reniform large, upright, always with a white spot inferiorly and usually filled with whitish spots or scales. Secondaries smoky; outwardly darker; discal lunule visible. Beneath with reddish powderings; an outer line and more or less evident discal dot. Thorax with dorsal tuft ferruginous, basal tuft blue-gray, abdominal tufts prominent.

Expands 40 to 48 millimetres, 1.60 to 1.90 inches.

HABITAT.—United States to Rocky Mountains.

This common and widely distributed species hardly needs detailed description. The deep red of median space, contrasting s. t. space, and dark terminal space are characteristic. Western specimens as a rule run much paler than those from the East. Its life history has been written in economic publications.

Xylophasia albina Grt.

1874. Grt., Buff. Bull. II, 157, *Hadena*.

1881. Grt., Bull. U. S. Geol. Surv. VI, 263, a var. *castanea*.

Luteous or rusty brown, often darker, sometimes with a more carmine suffusion. Beyond the reniform the wing is paler, more yellowish, and opposite internal angle there is a bluish-white patch beyond t. p. line. Basal line geminate, distinct; t. a. line geminate, outwardly curved between veins. T. p. line geminate, interior line darker; outwardly bent over cell, and marked on veins, strongly incurved in submedian interspace. S. t. line broad, of pale ground color, marked by a continuous brown preceding shade and the darker terminal space, its course irregularly sinuate, forming a distinct though not prominent **W** on veins three and four. A row of black terminal dots. Basal space often with a paler yellowish shade. Claviform large, concolorous, black ringed, extending nearly across the median space. Orbicular slightly paler, large, oval, oblique. Reniform large, upright, strongly white marked—always with at least a white center. Secondaries pale ochery fuscous with broad dark outer border, an inner dusky line and discal lunule. Beneath reddish powdery, with outer dusky line and lunule. Dorsal tufts of thorax pale, somewhat discolorous; basal tufts trilobed, prominent; abdominal tuftings prominent.

Expands 44 to 48 millimeters, 1.75 to 1.90 inches.

HABITAT.—California.

Closely allied to *arctica*, but sufficiently distinct by the entirely different ground color, and characters elsewhere pointed out.

Xylophasia castanea Grt.

1874. Grt., Buff. Bull. II, 156, *Hadena*.

cymosa Grt.

1881. Grt., Papilio I, 34, *Hadena*.

1881. Grt., Papilio I, 59, pr. syn.

1881. Grt., Bull. U. S. Geol. Surv. VI, 263, pr syn.

Dark smoky brown, s. t. space hardly paler; terminal space darker. Basal line geminate, black. T. a. line geminate, blackish, outwardly bent, and somewhat indented on the veins. T. p. line geminate, outer line obsolete, its course nearly as in the preceding species. S. t. line yellowish, rather evenly sinuate, sometimes interrupted. A series of small black terminal dots. A fairly distinct median shade line from costa between ordinary spots and then close to and parallel with t. p. line to inner margin. Claviform moderate, concolorous, narrowly

black ringed. Orbicular concolorous or slightly paler, ovate, somewhat oblique. Reniform large, broad, outwardly white marked. Secondaries dusky, somewhat darker outwardly. Beneath, dusky, powdery; secondaries with discal line and spot. Thoracic tufts not discolorous; basal tufts sometimes ferruginous tipped.

Expands 43 to 50 millimetres, 1.75 to 2 inches.

HABITAT.—California, Washington.

Easily distinguished from all the preceding, and with a decided relation to some of the species of the next group.

Xylophasia occidentis Grt.

1878. Grt., Bull. U. S. Geol. Surv. iv, 177, *Hadena*.

Ash gray; median and terminal spaces and costal region, except at apex, darker. A brown shade occasionally in median space. Basal line geminate, marked on costa; a longitudinal black shade over vein 1. T. a. line rather even, with a slight outward curve; inner portion of line obsolete. T. p. line geminate at inception, the outer line becoming obsolete over cell. A strong outward curve over cell, and a deep inward angle below reniform to vein two; then outwardly oblique to hind angle. S. t. line regularly sinuate, broad, marked by a continuous dusky preceding shade and the darker terminal space. A faint dusky line nearly through middle of median space. Claviform small, concolorous, black ringed. Orbicular, large, pale. Reniform large, kidney shaped, pale, inferiorly touching the t. p. line. Secondaries grayish fuscous, darker outwardly. Beneath very pale gray, with dusky outer line and discal spot. Thoracic tufts concolorous.

Expands 42 to 44 millimetres; 1.70 to 1.75 inches.

HABITAT.—Nevada, Colorado.

I have seen only the ♀; but there is little doubt of its being structurally like its allies. Its gray color and peculiarly incurved t. p. line render it readily distinguishable.

Group *Perpensa*.

Only one species—*perpensa* Grt—is referred to here. It agrees with the following **W**-marked group in habitus and in the longitudinal shade through the center of primaries. The latter are shorter, more obtuse, the margin scalloped, and the hind angle retracted. These features really form the only basis for the group; but the insect is a peculiarly marked one fitting in no other category, and as the divisions are purely artificial and for convenience of recognition only, there is no objection to the course. The tuftings of thorax are distinct, but not prominent; those of abdomen well marked. The genitalia are essentially like these of the preceding. The upper angle of tip of harpes is broad, deeply excavated, the inferior margin nearly straight, fringed with spinules; the inner inferior angle with a bunch of longer spines. The

clasper is short, thick at base, rather abruptly narrowing to a rather acute tip. In color the species is dull fuscous, with black markings and veins. The orbicular is elongate oval and oblique.

Xylophasia perpensa Grt.

1833. Grt., Can. Ent. 13, 229, *Hadena*.

Dark blackish fuscous, the markings black. A short basal streak; another along inner margin. T. a. line blackish, diffuse geminate, outwardly oblique, forming a long tooth in submedian interspace, then abruptly inward, and again forming an outward dent below vein 1; the latter vein is black marked to t. p. line. A black shade connects the median lines in the submedian interspace. T. p. line geminate crenate, outwardly bent over cell, then obliquely and rather evenly to inner margin. The included space is somewhat pale powdered. T. p. line indefinite, marked only by a contrast in shade; the terminal space being darker. A row of terminal dark dots. Fringes scalloped, at hind angle retreating. Claviform barely indicated. Orbicular elongate oval, oblique, black ringed, concolorous. Reniform upright, somewhat narrowing superiorly; incompletely dark ringed; paler outwardly. Secondaries smoky fuscous, darker outwardly, fringes paler. Outer line and discal dot reflected from under side. Head and thorax concolorous with primaries; collar with a black line. Beneath pale, grayish fuscous, powdery toward costal margin and apices; an outer common line and discal spot more distinct on secondaries.

Expands 32 millimetres=1.30 inches.

HABITAT.—ARIZONA.

The distinctive features have been already sufficiently pointed out.

Group *cariosa*.

The distinctive character of this group is the indentation of the s. t. line on veins 3 and 4, forming a distinct **W**, and this character is common to all the species of this group, as well as to those of the group *inordinata*. There are no other characters peculiar to this group only, which is nevertheless a compact and closely related one. All the species except *cuculliformis* and *genialis*, in which the maculation is obsolete, have a slender black basal streak, and another, parallel, along the hind margin close to base, forming the inner part of t. a. line at that point. The genitalia of the ♂ agree with the general characters given in the description of the genus, but present individual differences of some interest.

Cuculliformis, with which I head the list, is very readily distinguished by the long narrow wings, recalling the genus from which this species derived its name, as well as by the absence of the ordinary transverse maculation. The ♂ is not known to me.

Verbascoides is closely allied, but evidently distinguished by the distinct black shade below the middle of the wing, and the outer margins

are less dentate. The color is brownish yellow like the preceding, but the costal region is paler. The ♂ genitalia are of the usual type, the superior angle of the trigonate tip is excavated, and gives rise to the moderately long, curved clasper; along the inferior margin of the tip is a series of stiff spinules, longer than those fringing the outer margin.

Nigrrior is larger and darker than the preceding but with similar maculation, and with the genitalia about alike. The white powdered t. p. line on the dark ground gives the insect a distinctive appearance. I have seen this form labelled *sectilis*, and also associated with *cariosa*, but it is very distinct from either.

Cariosa is distinguishable at a glance from the preceding by the distinctly marked ordinary spots, the orbicular round, and by the presence of the claviform. It is rather a broad-winged form, and the costal region is paler than the dark fuscous brown ground color. The genitalia are distinctive. The clasper is entirely wanting, the superior angle of the trigonate tip is excavate, and somewhat produced, beak-like. The outer margin is fringed with spinules, and the inferior angle is furnished with two stout short corneous spurs.

Idonea is similar, but smaller, darker, more obscure in every respect, the costal region is not paler, and the claviform extends nearly across the median space. No ♂ of this species has been examined.

Vulgaris is rather a broad-winged form with obtuse apices; dull luteous or fuscous brown, with an irregularly strigate appearance. The genitalia are like those of *verbascoides*, except that the clasper is shorter, and there is a small supplementary corneous projection behind the tip. The orbicular is decumbent.

Up to this point all the species have very distinct divided crests on the thorax, extending forward, partly overlooking the collar and reaching backward to the base. In the following species this crest is not nearly so prominent, though distinct, and does not form the prominent and striking feature that it does in the previous series.

Antennata is a dark form, with a deep red-brown suffusion, somewhat indistinct transverse lines, and a general resemblance to the *cariosa* type of maculation, differing in the decumbent orbicular, which is typical of all the following species of this group. The genitalia are close to those of *verbascoides*, save that the clasper is much longer, extending to the inferior angle of tip. The outer margin of tip is also straighter.

Cinefacta is at once different from all others in the group by the pale gray color with more or less luteous, or as Mr. Grote says, "olivaceous fuscous" suffusion, most distinct through the median space, but entirely lacking in two Colorado specimens that I cannot consider as distinct. The genitalia are peculiar. The tip has the angles rounded, the superior much prolonged, and forming a somewhat ladle shaped process. The clasper is short, very broad, conic rather beak-like, and there is another longer, more slender, curved corneous hook on the

side piece some distance from the tip. The outer margin of the tip has the usual fringe of spinules, and the inner edge has a series or rather a brush of small spines.

Auranticolor is a bright yellowish red-brown form, with violet powderings especially distinct along the inner margin and through s. t. space. It is very distinct from all the preceding, and forms the bridge to the other groups. No ♂ has been examined.

Lignicolor differs from all the preceding by the indistinct claviform, and lack of distinct connecting shade between the median lines. The color is more dull than in *auranticolor* but also very similar. The genitalia are as in *antennata*, the clasper somewhat dilated towards the tip.

Genialis is closely allied, but the maculation is obsolete. The genitalia are almost identically like those of *lignicolor*, and a comparison of the figures will show best wherein they differ.

Relicina is related to *cinefacta*, but is bluish gray, and has the median lines very strongly dentate, and so is easily recognizable.

Centralis is also related to *cinefacta*, but is a more whitish gray, with more even median lines, and an obviously darker, somewhat contrasting median space.

SYNOPSIS OF SPECIES.

- Primaries narrower, sub-equal, margin strongly dentateCUCULLIFORMIS
- Primaries wider, more trigonate; margin less, or not dentate.
- A broad blackish shade between median lines not usually extending beyond the t. p. line.
 - Claviform wanting; t. a. line indefinite.
 - Yellowish brown, costal region palerVERBASCOIDES
 - Blackish brown, costal region not paler.....NIGRIOR
 - Claviform distinct; t. a. line usually well marked.
 - Orbicular round.
 - Costal region paler, maculation well definedCARIOSEA
 - Costal region concolorous, color more sordid, maculation less definite, claviform, extending nearly across median spaceIDONEA
 - Orbicular decumbent elongate.
 - Broader winged; dull, luteofuscous, strigate, t. p. line geminately punctiform superiorly; outer margin more dentate.....VULGARIS
 - Narrower winged, apices more produced, t. p. line not punctiform.
 - Fuscous brown, with a dark red-brown suffusionANTENNATA
 - Blue gray t. a. and t. p. lines strongly dentate and angulateRELICINA
 - Ash gray, with luteous suffusion through median space; ♂ antennæ thicker, t. a. line dentate below median vein only CINEFACTA
 - Pale ash gray, median space dark, t. a. line not dentateCENTRALIS
 - Reddish brown, bright; t. p. line accompanied by a bright violet shade often invading s. t. space.AURANTICOLOR
 - No black shade between the median lines.
 - Claviform indistinct or wanting; color pale leather brown.
 - Maculation distinctLIGNICOLOR
 - Maculation obsoleteGENIALIS

Xylophasia cuculliformis Grt.1875, Grt., Check List, 1875, 21, *Hadena*.

Luteous brown, pale; a dusky shade along internal margin, deepening outwardly to outer margin. A triangular dark brown shade above the **W** mark, its apex at t. p. line, gradually broader to outer margin. T. a. line obsolete. T. p. line geminate, with a wide outward curve over cell; continuous only at inception, then punctiform to hind margin; a white dot separates the dusky spots, and in the darker submedian shade takes the form of a narrow white line, crossing this shade. S. t. line indefinite, only the **W** being at all well marked. The fringes are dentate, darker brown, cut with ground color. The ordinary spots are concolorous and very indefinite; orbicular elongate, decumbent, extending to but not confluent with the reniform, which is moderate in size and normal in form; a blackish point marks its outer margin. The internal margin is marked with white scales. Secondaries very pale yellowish, semi-transparent, outwardly darker; beneath pale, with somewhat indefinite outer line and discal spot. Head and collar paler; the latter with a narrow black line. Thorax darker, the tuftings with a gray shade. The tuftings of abdomen are dark, very equal, and extend to the sixth segment.

Expands 43 millimetres; 1.65 inches.

HABITAT.—California.

Two ♀ specimens agree in all points, and are easily distinguished from their congeners by the narrower wings, the outer margin distinctly dentate. The rather prominent tuftings and quadrate thorax afford other distinctive features.

Xylophasia cristata Grt.1878, Grt., Bull. U. S. Geol. Surv., IV, 176, *Hadena*.

“♂ Thorax ferruginous, strongly crested; body comparatively slender; abdomen tufted; size large. Fore wings dusky ochreous, with all the markings dotted and fragmentary. Lines marked in black on costa. Reniform barely indicated with a black central dot. T. p. line a double series of black dots, the inner line represented by a white curved streak crossing a dark shade on submedian fold, thus allying the moth to *cuculliformis* and *verbascoides*. Terminally the wing is shaded blackish, twice more prominently at the middle and at internal margin across the narrow pale s. t. line. Fringes blackish, cut with ferruginous ochrey at end of veins. A fine ferruginous basal streak and internal margin shaded with rusty. Hind wings fuscous, with rusty-ochre fringes and shaded with ochre along external margin. Beneath pale ochre with rusty tinge; on hind wings a waved medial line marked in the veins, and a discal lunule. Primaries with lunule and straight line double and angulate at costa. *Expansion*, 45 millimetres. Buffalo. (A. R. Grote.)”

This was described by Mr. Grote from a species named but not published by Dr. Harvey. It must be a near ally of *eucliformis*, but I do not know it.

Xylophasia verbascoides Gn.

1852, Gn., Sp. Gen. Noct., 1, 141, *Xylophasia*.

1856, Wlk., C. B. Mus. Lep. Heb., ix, 170, *Xylophasia*.

1873, Grt., Buff. Bull., 1, 109, *Hadena*.

Yellowish brown, with a richer longitudinal shade through the center and the costal region paler. The median lines are nearly obsolete. Basal line wanting. T. a. line marked by geminate dots on costa, subcostal and median veins. T. p. line unusually near to outer margin, consisting of a series of geminate venular dots to submedian space, where it forms a distinct pale lunule, margined by narrow black lines. The line makes a wide outward curve opposite the cell. S. t. line indistinct at inception, pale, strongly dentate on veins three and four, and there touching the outer margin. Orbicular very indefinite, concolorous, elongate, oblique. Reniform indefinite, upright, marked by blackish scales. A fine black basal streak, a black streak at inner margin near base. A broader black dash through submedian space, interrupted by the white lunule of t. p. line. Terminal space darker, except at apex. Median vein with a narrow black line, margined with white scales to its furcation; veins three and four similarly marked to the outer margin. Secondaries smoky fuscous, paler toward base, and with an obvious discal lunule. Secondaries brown, powdery, with distinct large discal spots. Head pale, vestiture of front tipped with black; collar brown, with an inferior white line, bordered above by a broader black line, tipped with white. The divided tuft is prominent, pale at the sides. Patagiae with a white marginal line and darker center. Dorsal tufts of abdomen distinct. Genitalia of the ♂ with a series of spinules at the inner inferior margin of the tip; a distinct moderately long elasper, not reaching to the end of tip.

Expands 37 to 42 millimetres; 1.50 to 1.70 inches.

HABITAT.—Middle and Eastern States.

A strongly marked and easily recognizable species. The pale color of the costal region, the dark brown and black longitudinal shades and streaks through the middle, and obsolete transverse maculation are distinctive. The species is not rare.

Xylophasia nigrior Smith, sp. nov.

Pattern of maculation like that of *verbascoides*, but more distinct. Smoky brown with a distinct deep carmine tinge, costal region marked with pale scales to t. p. line. Basal line faintly marked, geminate. T. p. line marked with whitish scales, the geminate venular dots defining its course. All the veins black marked. Ordinary spots outlined by pale scales forming a rather broad but somewhat vague and incomplete ring; form as in *verbascoides*, and the longitudinal black marks and

shades are also similar. The black dash at inner margin near base is followed by a white shade, outwardly defined by a blackish line. Secondaries dark, smoky, paler toward base, fringe yellowish. Head and thorax and maculation of under side as in *verbascoides* but darker.

Expands 47 millimetres, 1.85 inches.

HABITAT.—Maine.

Closely allied to *verbascoides*, but yet distinguishable at a glance by the darker color and narrowly white-powdered costal space. The powdery pale t. p. line is also distinctive. The type is a fine specimen from Mr. Thaxter, and I have seen others in his collection and in those of Mrs. Fernald and Mr. Eddy, of Bangor.

Xylophasia cariosa Gn.

1852. Gn., Sp. Gen. Noct. 1, 144, *Xylophasia*.

1856. Wlk. C. B. Mus. Lep. Het. IX, 178, *Xylophasia*.

1873. Grt., Buff. Bull. 1, 109, *Hadena*.

1874. Grt., Can. Ent. VI, 15, *Hadena*.

Fuscous gray, the terminal space darker, and a darker shade through median space, often with a variably deep red-brown tinge throughout. Basal line geminate, marked on costa only. T. a. line fairly distinct, geminate, waved, outwardly bent to submedian vein, then with a long inward streak, defined by a distinct black dash, to the inner margin near base. T. p. line geminate, even; outer line punctiform; strongly bent over cell, thence nearly parallel with outer margin. S. t. line indefinite at inception, indenting the terminal space on veins 3 and 4, to form the **W** mark peculiar to the group. A row of black terminal lunules. A fairly distinct shade line through median space, starting from the costa at its middle, obliquely outward, touching reniform inferiorly nearly to t. p. line, thence parallel with and close to t. p. line to hind margin. A black basal streak, beneath which the basal space is darker. Claviform distinctly outlined, obscured by a dark shade, which extends to the s. t. line, interrupted by the t. p. line. Ordinary spots concolorous, distinctly outlined, orbicular rounded, reniform upright, oblong. Head and thorax essentially as in the preceding species. Secondaries smoky fuscous with yellow fringes. Beneath rather pale, powdery, with very distinct outer line on both wings and distinct discal spot on secondaries.

Expands 35 to 38 millimetres, 1.40 to 1.55 inches.

HABITAT.—Northern, Eastern, and Middle States to North Carolina.

Not uncommon, and readily distinguished from the preceding by the distinct claviform.

Xylophasia idonea Grt.

1882. Grt., Can. Ent. XIV, 18, *Hadena*.

Even obscure fuscous gray, with the maculation essentially as in *cariosa*, but much less defined. The claviform extends nearly across the median space, the longitudinal shade is indefinite, the s. t. line is

inwardly defined by a row of confluent dusky spots, and outer portion of the t. p. line is continuous and not punctiform. Otherwise everything as in *cariosa*.

Expands 38 millimetres, 1.55 inches.

HABITAT.—Texas, Arizona, Wisconsin.

This is the Western representative of *cariosa*, but undoubtedly distinct from it. The more even dull ground color, the long claviform, and even t. p. line are distinctive features. It seems not common.

Xylophasia vulgaris G. & R.

1866. Grt. and Rob., Proc. Ent. Soc. Phil. VI, 19, pl. 3, f. 2, *Xylophasia*.

1873. Grt., Buff. Bull. I, 110, *Hadena*.

1874. Grt. 6th Rept. Peab. Ac. Sci. 32=*Xylina socia*.

Luteous brown, rather sordid; the veins black marked; terminal space darker. Transverse maculation indistinct. Basal line geminate, marked on costa only. T. a. line geminate, irregularly dentate, more or less obsolete through middle of wing. On the hind margin the inner portion of line forms the usual black dash, which reaches nearly to base. T. p. line geminate, punctiform except through submedian interspace, where it interrupts the longitudinal black shade which extends from the orbicular to s. t. line. S. t. line as in *cariosa*, preceded by a darker shade, sometimes forming blackish spots. A row of black terminal lunules. The median shade is indefinite, visible only between the ordinary spots. Claviform rather indefinitely outlined, but always present. Orbicular decumbent elongate; reniform upright, rather vaguely defined. Secondaries and under side as in *cariosa*. Head and thorax also marked as in *cariosa*, save that the ground color is more reddish brown.

Expands 40 to 45 millimetres; 1.60 to 1.80 inches.

HABITAT.—Middle and Eastern States, Washington.

Strongly resembles *cariosa*, but obviously distinct by the different ground color and decumbent orbicular. It is not common.

Mr. Grote, in the Sixth Rept. Peab. Ac. Sci., 32, refers this species as a synonym of *Xylina socia* Hufn. and in the Catalogue in Buff. Bull. II, he makes the same reference. In the list of 1875 this synonymy is abandoned, and has not since been referred to. This species is certainly no *Xylina*.

Xylophasia antennata Smith, sp. nov.

Fuscous brown, with a brighter red-brown suffusion, s. t. space powdered with whitish scales. Basal line geminate, blackish. T. a. line geminate, superiorly obsolete, outwardly curved in submedian space, inwardly bent below vein 1; here marked with white scales and by the usual black dash. T. p. line geminate at inception, and very indistinct to vein 4; thence single, black, distinct, somewhat produced on the veins. S. t. line somewhat paler, with W mark distinct; terminal space darker; a fine black terminal line, followed by a pale line at base of

fringes. Claviform small, connected with t. p. line by a distinct black shade. An indefinite dark median shade. Ordinary spots, somewhat paler, indistinctly outlined. Orbicular oblique, elongate, reniform upright. Secondaries smoky fuscous, paler towards base. Beneath with carmine powderings; an indefinite dusky common line and discal spot. Head and thorax deep brown, collar and patagiae with darker lines.

Expands 38 millimetres, 1.50 inches.

HABITAT.—California.

A single ♂ specimen in collection of U. S. National Museum, from the Riley Collection.

Xylophasia relicina Morr.

1874. Morr., Pr. Bost. Soc. N. H. XVII, 216 *Hadena*.

1882. Grt., List 1882, *Luceria*.

“Expanse 40 millimetres. Length of body 22 millimetres.

“Eyes naked. The antennæ of the male with fine hairy clothing. The palpi and front as usual in the genus. The collar and pterygodes black, the former with a distinct transverse black line; behind the collar a low longitudinally furrowed tuft. The abdomen with short tufts on the first three segments. Ground color of the anterior wings light gray, variegated with darker gray and black; a distinct basal dash, and beneath the submedian nervure another similar dash; the median lines black, single, and strongly dentate; the interior line forming two conspicuous teeth on the costa, the lower one touching the orbicular spot; to the lobe between the median and submedian nervures the strongly marked black-lined claviform spot is attached, and extends to the exterior line; beneath the submedian nervure the lines are again connected by a long, sharp tooth; the exterior line is intercepted on the costa above the reniform spot; below its teeth are short and regular, but it forms one very sharp inward indentation, reaching the reniform spot; the ordinary spots concolorous, with black annuli; the orbicular oblique, the reniform upright, with its annulus outwardly obsolete; the terminal portions of the nervules tinged with black; the subterminal line whitish, very jagged, marked chiefly by the contrast between the light subterminal and the dark terminal spaces; a series of triangular dots at the base of the fringe, which is dark, intersected with light. The posterior wings white, with a very faint terminal border, and a black line at the base of the concolorous fringe. Beneath whitish, the anterior wings with a discal dot and median line.

“HABITAT.—Waco, Texas.

“This beautiful and distinct species belongs to the section *Xylophasia*, and is related to *H. lignicolor*, but the markings are more acute, and the ground color is gray, without brown or ochreous admixture.”

Mr. Grote referred this species to *Luceria*; why, I can not see. A single ♀ only is before me, but from that I should have no hesitation in referring it to this series. The strongly dentate median lines are characteristic and thus far unique in the genus.

Xylophasia cinefacta Grt.1851. Grt., Papilio 1, 77, *Hadena*.

Ash gray, pale, powdery; more or less suffused with luteous, most evidently so in the median space; terminal space darker. Basal line obsoletely indicated. T. a. indistinctly geminate, strongly angulate in submedian space, and somewhat confused and indefinite to the hind margin. The basal space is strongly white-powdered. T. p. line nearly parallel with outer margin, slightly produced on the veins. S. t. line pale, incomplete, with the usual **W** mark; through the middle of the wing preceded by a dusky interrupted shade. The s. t. space is pale, the veins flecked with black scales. A black basal streak. Claviform usually extending nearly across the median space, a dark shade line completing the connection. Orbicular elongate, oblique, sometimes confluent, with the upright reniform. A faint median shade crosses between the spots, sometimes darkening the outer portion of median space. Secondaries fusco-luteous, paler toward base. Beneath, pale, powdery, with somewhat indefinite outer line and discal spot. Head and thorax concolorous, collar and patagiæ with black line.

Expands 35 to 40 millimetres, 1.40 to 1.60 inches.

HABITAT.—Washington, California, Colorado.

The specimens from Colorado differ in lacking all yellow shade, but not in structure or maculation so far as observable. I have seen no specimens from Washington. The type from Mr. Edwards's collection is marked "So. Calif."

Xylophasia centralis Smith, sp. nov.

General color of head, thorax, and primaries whitish with a variable tinting of luteous. Collar with a central black line, patagiæ black margined. Primaries with a narrow black basal streak below median vein and another along internal margin. Along costa and inner margin the pale basal space is slightly clouded. Basal line geminate, indistinct. T. a. line geminate, outer part distinct, black, inner vague, powdery; the line outwardly oblique, slightly curved, somewhat irregular, but nowhere dentate or angulate. T. p. line as a whole almost parallel with outer margin after the usual bend over reniform; geminate, outer line not distinct, inner line but slightly crenulate over reniform, else even. A distinct, broad median shade from costa between the ordinary spots outwardly oblique to vein 2, there angulate and then parallel with and close to t. p. line to inner margin. S. t. line white, irregular, the **W** mark prominent, preceded by two distinct black sagittate marks. The line is preceded by a luteo-fuscous shade, variably distinct, the s. t. space else whitish. A row of black terminal lunules, fringes cut with white. Terminal space, except apical patch, dusky. Median space dusky, with a slight fuscous tinge. Orbicular oval, complete, oblique, concolorous, with a darker fuscous central spot. Reniform large, broad, upright, somewhat dilated inferiorly, pale marked, the

space beyond it of the pale ground color, sometimes obscuring the t. p. line at that point. Claviform distinct, narrowly black margined, concolorous, the inferior border continued to connect the median lines. Secondaries fuscous, with paler fringes. Beneath smoky, secondaries more powdery, with an outer line and discal spot.

Expands 1.60 to 1.75 inches, 40 to 44 millimetres.

HABITAT.—Sierra Nevada, California.

Several specimens of both sexes sent me by Mr. Hy. Edwards. The species is a distinct one, allied to *cinefacta*, than which this is a larger form, differing in the distinctly darker median space and obvious median shade. There are no angulations to the t. a. line, and the genital structure of the male is distinctive. It is scarcely possible to confuse this with any other of our described species.

Xylophasia auranticolor Grt.

1873 Grt., Buff. Bull. I, 109, *Hadena*.

Rather bright pale red-brown, with more luteous shadings and violet powderings. T. a. line geminate, with a wide outward curve in submedian space and a long inward bend below vein 1, where it is marked with violet scales, preceded by the usual black dash; else the included space is yellowish brown. T. p. line outwardly curved over reniform, thence parallel with outer margin; geminate, tolerably even, the included space violet powdered, this color sometimes extending through and suffusing the s. t. space. S. t. line yellow brown, with the usual W mark distinct; preceded by darker-brown shades. S. t. space sometimes violet powdered, but usually where the violet powderings encroach on the s. t. space the terminal space is darker brown. Fringes checked with ferruginous; a fine black terminal line. A black basal streak. Claviform paler, black margined, a brown shade connecting it with the t. p. line. Ordinary spots paler, large, dark ringed. Orbicular elongate, oblique, reniform upright, kidney shaped. A faint median shade, distinct only on costa; hind margin with violet powderings. Secondaries smoky fuscous, with reddish fringes. Beneath red brown, powdery, with dusky outer line, and discal dot on secondaries. Head and thorax concolorous with primaries, powdered with violet.

Expands 39 to 45 millimeters, 1.55 to 1.80 inches.

HABITAT.—Colorado and Washington.

A handsome and distinctly marked species which is not common in collections.

Xylophasia lignicolor Gn.

1852. Gn., Sp. Gen. Noct. I, 140, *Xylophasia*.

1856. Wlk., C. B. Mus. Lep. Het. IX, 176, *Xylophasia*.

1873. Grt., Buff. Bull. I, 109, *Hadena*.

1879. Strk., Rept. Chief Eng. 1878-'79, v, 186, *Hadena*.
var *quærita* Grt.

1876. Grt., Can. Ent. VIII, 26, *Hadena*.

1877. Grt., Can. Ent. IX, 197, pr. var.

Varies from pale luteous to dark leather brown. Apex and an irregular large blotch beyond reniform, paler; terminal space darker. Transverse maculation indistinct. T. a. line geminate, irregularly dentate, well marked only below vein 1, where it is preceded by the usual dark streak. T. p. line geminate, rather even, interrupted, outer line punctiform beneath vein 5, included space somewhat paler than ground color. S. t. line pale, distinct throughout. **W** mark distinct, preceded by an irregular dark shade, which in the costal region extends to the t. p. line. Claviform faintly marked, a slightly darker brown shade indicating the position of the ordinary black dash. A dark basal streak. Ordinary spots moderately defined; orbicular variable in size, oblique, elongate; reniform upright, inferiorly dark filled. A row of terminal black lunules; fringes dark, cut with pale. Secondaries fuscoluteous, paler at base. Beneath reddish, powdery, with common line and discal spot. Head and thorax concolorous with primaries, patagiæ darker margined.

Expands 42 to 47 millimetres, 1.68 to 1.88 inches.

HABITAT.—Canada, Eastern, Middle, and Western States, Arizona, Colorado.

Rather a common and widely distributed species. The name *quesita* was applied by Mr. Grote to dark, well marked specimens with smaller orbicular.

Xylophasia genialis Grt.

1874. Grt., Buff. Bull. II, 66, *Hadena*.

Pale leather brown with the maculation subobsolete. The s. t. line is usually paler and fairly distinct, the **W** mark evident. S. t. space usually with darker powderings. The maculation so far as it is traceable is like that of *lignicolor*. It also bears a resemblance to *dubitans*, from which it may be distinguished by not having the reniform white marked, and the distinct **W** of s. t. line.

Expands 42 to 47 millimetres, 1.68 to 1.88 inches.

HABITAT.—California.

The species is not common, and has been already sufficiently distinguished from its allies.

Group *inordinata*.

Two species referred to this group differ from all the others belonging to the genus by brownish-yellow secondaries and distinct white maculation of primaries, the **W** mark of the s. t. line being distinct. The ♂ antennae have the joints marked, and they are furnished with lateral tufts of bristly hair. The genital parts of one of the species is like those typical of the group, and there is in addition to the stout clasper, which is close to the tip, another stout, more slender, corneous hook, rather enlarging toward the tip. The superior apex of tip is deeply excavated and the fringe of spinules is rather sparse. The species belonging here are very readily distinguished and are interesting by their peculiar variations.

Inordinata was described from Massachusetts, and the type is like

the ordinary Eastern form; the yellow pale, the white powderings rather dense, the transverse lines broad, and the dusky median line of secondaries distinct. The head is fairly prominent, though smaller and more retracted in the ♀; the thoracic tufting is distinct, and the secondaries beneath have a distinct though interrupted outer line. In Colorado occurs a form of what I take to be merely a variety of the Eastern form, but which may eventually prove distinct. It is somewhat smaller, the head is more retracted, thoracic tufting less decided, the ground color much deeper, more orange yellow, white lines narrower, powderings sparse.

The outer dark margin of secondaries is more intense, the inner line very faint and close to the outer band. Beneath there is *no* extra median line, and the marginal dark shade on both wings is strongly marked. These differences seem permanent in the series before me, but I can not convince myself they are specific, and propose the term *montana* for the variety.

Semilunata Grote is smaller than the preceeding, the head is still smaller, more retracted with a strong suggestion of *Anarta*, heightened by the loose, indistinctly tufted thoracic vestiture, and the abdomen is smooth, scarcely tufted in the ♀, and dark. The primaries are of a sordid blackish fuscous, the white lines often obscured, the yellow faint and pale, sometimes hardly traceable, while the secondaries are also pale and lack the median narrow line, though it is sometimes indicated. Beneath it is very pale, and the outer common line is wanting.

To a great extent the Colorado specimens fill the gap between this species, found only in Washington thus far, and the eastern *inordinata*, but the very pale color, sordid blackish suffusion, and *anartiform* appearance is distinctive, and probably three species will be eventually recognized.

Xylophasia inordinata Morr.

1875. Morr., Proc. Ac. N. Sci. Phil. 1875, 63, *Hadena*.

Brownish yellow, varying from a shade verging on luteous to nearly orange shaded with black and white to a greater or less extent. Median lines geminate, very narrow, darker, included space white and prominent, giving the appearance of simple white lines. T. a. line sinuate and outwardly areuate; t. p. distinctly angulate beyond the cell, thence rather evenly oblique to hind margin. S. t. line distinct, marked with white scales; W mark prominent; line preceded by a series of black sagittate marks. A row of black terminal lunules. Basal line very indistinct, pale, angular; basal space more or less powdered with black and white scales, sometimes the one, sometimes the other predominating. Costal region usually white powdered to the apex. The median space is black shaded, leaving a central space and the region beyond reniform, of ground color. S. t. space more or less powdered. Terminal space, except at apex, uniformly darker. The ordinary spots are very variable in size and form, usually with darker center and white annuli, sometimes entirely white. Secondaries dull yellow with broad

black margin, a fine median dark line, and a distinct discal lunule. Beneath paler yellow, with distinct common line and discal lunules and broad faint powdery dark margin.

Expands 32 to 35 millimetres, 1.28 to 1.40 inches.

HABITAT.—Massachusetts, Maine, Colorado.

The thorax is of the ground color, collar with base and tip whitish, patagiæ with white tips, preceded by a dusky line.

Xylophasia semilunata Grt.

1881. Grt., *Papilio* 1, 58, *Hadena*.

Sordid blackish fuscous over a yellowish base; maculation white, interrupted, pattern as in *inordinata*. Thoracic tuftings indistinct, vestiture somewhat divergent, short; color uniformly dark. Secondaries without the median dark line, else as in *inordinata*. Beneath pale yellow with dusky margins and large discal spot, but *no* common exterior line.

Expands 28 to 30 millimetres, 1.12–1.20 inches.

HABITAT—Washington.

The differences between this and *inordinata* are elsewhere detailed.

SPECIES UNKNOWN TO ME.

Xylophasia libera Wlk.

1856. Wlk., *Cat. Brit. Mus. Lep. Het.* ix, 179.

“Testaceo-cana; thorax fascia vittisque duabus nigris; alæ anticæ disco et margine exteriore ex parte fuscis nigro strigatis, strigis duabus lunulisque marginalibus liturisque costalibus nigris, annulis discalibus nigromarginatis; posticæ cinereæ, ciliis pallidis,”

“*Xylophasia cariosa*?”

“*Male*. Testaceous, hoary. Thorax with a black band in front, and with a black stripe on each side. Fore wings partly brown, and streaked with black in the disk and along the exterior border, in the middle of which there are two lanceolate streaks; a row of blackish marks along the costa; discal ringlets with black borders; exterior border with black lunules. Hind wings cinereous with pale ciliæ. Length of the body 5 to 6 lines, of the wings 14 lines.”

“New York.”

It is scarcely likely that this description refers to any species not herein described under some other name, and probably Walker's own suggestion of *cariosa* is the true one.

Mr. Grote (*Ill. Essay* 44), refers this to *Mamestra grandis*, as a synonym; but the description can scarcely be tortured into application to that species, while it does agree very well with *X. cariosa*.

Xylophasia infixa Wlk.

1856. Wlk., *Cat. Brit. Mus. Lep. Het.* ix, 178.

“Subcervina; caput et thoracis fascia fusciscentia; alæ anticæ punctis costalibus, vitta discali striga posteriore strigisque exterioribus nigris; posticæ pallide cinereæ, marginibus latis fusciscentibus.”

“Pale dead-wood color. Head and band of the thorax brownish. Fore wings with some black costal speckles, and with a black stripe traversing the discal ringlets, and with exterior black streaks. Hind wings pale cinereous, with broad brownish borders. Length of the body 5 lines; of the wings 12 lines.”

“A. Florida.”

This gives the impression of a species of *Homohadena*, but no transverse maculation is mentioned. It will be difficult to identify without reference to the type.

LIST OF SPECIES OF HADENA.

[Starred (*) species represented in the Museum collection.]

- | | |
|----------------------------|--------------------------|
| § <i>Luperina</i> Boisd. | X. EXULIS Lef.* |
| L. NIVEIVENOSA Grt. * | <i>gelata</i> Lef. |
| L. STIPATA Morr. * | <i>grœnlandica</i> Zett. |
| L. PASSER Gn. * | <i>cervina</i> Germ. |
| <i>loculata</i> Morr. | <i>marmorata</i> Zett. |
| var CONSPICUA Morr. | <i>diffusa</i> Geyer. |
| L. BURGESSI Morr. * | <i>gelida</i> Gn. |
| <i>discors</i> Grt. | <i>poli</i> Gn. |
| L. LONGULA Grt.* | <i>borea</i> Gn. |
| § <i>Xylophasia</i> Steph. | X. SOMMERI Lef. |
| X. REMISSA Hbn. * | X. ARCTICA Boisd. * |
| <i>indocilis</i> Wlk. | <i>amputatrix</i> Fitch. |
| X. ILLATA Wlk. * | <i>amica</i> † Harr. |
| <i>insignita</i> Wlk. | X. ALBINA Grt. |
| <i>suffusca</i> Morr. | X. CASTANEA Grt. |
| X. VULTUOSA Grt. * | <i>cymosa</i> Grt. |
| X. APAMIFORMIS Grt. * | X. OCCIDENS Grt.* |
| <i>contenta</i> Wlk. | X. PERPENSIS Grt. |
| X. EXORNATA Mœschl. | X. CUCULLIFORMIS Grt |
| X. HULSTII Grt. | X. CRISTATA Grt. |
| X. FINITIMA Gn. * | X. VERBASCOIDES Gn. |
| X. LATERITIA Hufn. * | X. NIGRIOR Smith. |
| <i>molochina</i> Hubn. | X. CARIOSA Gn. * |
| <i>insignita</i> Wlk. | X. IDONEA Grt. |
| <i>dubitans</i> Wlk. | X. VULGARIS G. & R. * |
| X. COGITATA Smith. * | X. ANTENNATA Smith. * |
| X. MORNA Strk. | X. RELICINA Morr.* |
| X. SPUTATRIX Grt. * | X. CINEFACTA Grt. |
| <i>insignita</i> Wlk. | X. CENTRALIS Smith. * |
| X. PLUTONIA Grt.* | X. AURANTICOLOR Grt.* |
| X. ALTICOLA Smith.* | X. LIGNICOLOR Gn. * |
| X. DUCTA Grt. | var QUÆSITA Grt. |
| <i>separans</i> Grt.* | X. GENIALIS Grt. |
| X. IMPULSA Gn.* | X. INORDINATA Morr. * |
| var MIXTA Grt. | var MONTANA Smith.* |
| X. DEVASTATRIX Brace. * | X. SEMILUNATA Grt. * |
| <i>ordinaria</i> Wlk. | SPECIES UNDETERMINED. |
| <i>contenta</i> Wlk. | X. LIBERA Wlk. |
| <i>abjecta</i> var † Gn. | X. INFIXA Wlk. |

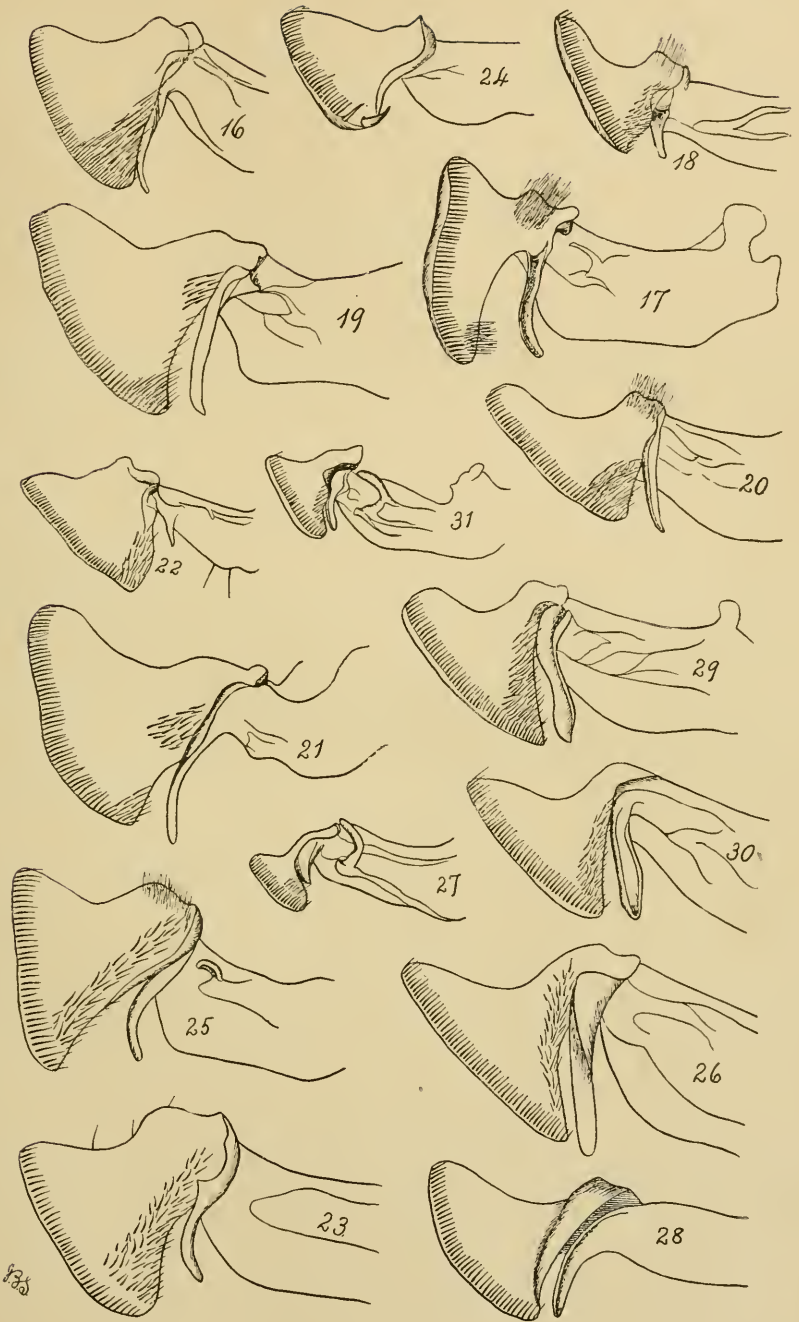
EXPLANATION OF FIGURES TO PLATES 36 AND 37.

The figures are numbered consecutively, but are not regularly arranged on the plates. The right harpe and its attached processes are shown in each instance.

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| 1. <i>Luperina stipata</i> . | 17. <i>Xylophasia devastatrix</i> . |
| 2. <i>Luperina passer</i> . | 18. <i>Xylophasia exulis</i> . |
| 3. <i>Luperina burgessi</i> . | 19. <i>Xylophasia arctica</i> . |
| 4. <i>Luperina longula</i> . | 20. <i>Xylophasia albina</i> . |
| 5. <i>Xylophasia remissa</i> . | 21. <i>Xylophasia castanea</i> . |
| 6. <i>Xylophasia illata</i> . | 22. <i>Xylophasia perpensa</i> . |
| 7. <i>Xylophasia vultuosa</i> . | 23. <i>Xylophasia verbascoides et</i>
<i>Xylophasia nigrior</i> . |
| 8. <i>Xylophasia apamiformis</i> . | 24. <i>Xylophasia cariosa</i> . |
| 9. <i>Xylophasia exornata</i> . | 25. <i>Xylophasia vulgaris</i> . |
| 10. <i>Xylophasia finitima</i> . | 26. <i>Xylophasia antennata</i> . |
| 11. <i>Xylophasia lateritia</i> . | 27. <i>Xylophasia cinefacta</i> . |
| 12. <i>Xylophasia cogitata</i> . | 28. <i>Xylophasia centralis</i> . |
| 13. <i>Xylophasia sputatrix</i> . | 29. <i>Xylophasia lignicolor</i> . |
| 14. <i>Xylophasia plutonia</i> . | 30. <i>Xylophasia genialis</i> . |
| 15. <i>Xylophasia alticola</i> . | 31. <i>Xylophasia inordinata</i> . |
| 16. <i>Xylophasia impulsiva</i> . | |



GENITAL STRUCTURE OF LUPERINA AND XYLOPHASIA.



GENITAL STRUCTURE OF XYLOPHASIA.

