

**KEY TO SELECTED PYRALOIDEA (LEPIDOPTERA) LARVAE INTERCEPTED
AT U. S. PORTS OF ENTRY: REVISION OF PYRALOIDEA IN “KEYS TO SOME
FREQUENTLY INTERCEPTED LEPIDOPTEROUS LARVAE” BY WEISMAN
1986**

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Abstract. - A key to frequently intercepted lepidopterous larvae, designed for U. S. Department of Agriculture, Animal and Plant Health Inspection Service (USDA, APHIS) identifiers at U.S. ports, was last revised in 1986. Since then many changes have occurred in the classification, nomenclature, and the nature of commodities being imported into the U.S. In this revision of the section on Pyraloidea, species recently intercepted are included, the most recent generic combinations are used, and families and subfamilies are now included in the key. Distributions are updated, stating if the species occurs in Hawaii or restricted areas of the continental United States. A “Note” section explains changes and additions, and gives references to further information. Two tables are provided, one to the classification of Pyraloidea with reference to placement in the key and another to the hosts and/or commodities.

Key Words. - continental United States, Florida, Hawaii, hosts, Pyralidae, Crambidae

The Pyraloidea is estimated to be the second largest superfamily in the Lepidoptera, with more than 16,000 described species worldwide. Pyraloid caterpillars are very diverse in what they eat: “they consume dried or decaying plant or animal matter, wax in bee and wasp nests, and living plants. Some are known to be inquilines in ant nests (some Galleriinae), predators of scale insects (some Phycitinae), and aquatic scavengers in flowing water (some Nymphulinae) (Solis 1997). The plant feeders can be leaf rollers, leaf tiers, leafminers, and stem borers, and sometimes a combination. Pyraloid caterpillars are pests that cause damage and economically affect crops such as rice, sugarcane, corn, tomatoes, and many more; some are worldwide pests of stored products such as grains and fruits (Solis 1996).

Because so many pyraloid caterpillars are intercepted at ports in commodities being imported into the United States, the Pyraloidea part of “Keys for the identification of some lepidopterous larvae frequently intercepted at quarantine” by Hahn W. Capps, Division of Insect Identification, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture was first published in 1939. It was published again in Spanish (Capps 1955) by the Agriculture Department of Mexico and again in English (Capps 1956, 1963) with only nomenclatural revision. It was not significantly revised again until 1986, when D. M. Weisman published “Keys for the identification of some frequently intercepted lepidopterous larvae.” He added 40 species and replaced the Heinrich (1916) system of setal nomenclature with the Hinton (1946) system. The revision presented here adds new taxa, incorporates recent new combinations, and provides keys to the family and subfamily levels of Pyraloidea. This revision also updates distributions, stating if taxa occur in restricted areas of the continental U.S. and Hawaii. A “Note” section explains changes and additions, adds relevant information, and gives references to further information. Two tables provide host and classification information.

The Pyraloidea has undergone both phylogenetic and nomenclatural changes because it is a group where taxonomists are actively pursuing questions that have both theoretical and applied ramifications. In the 1980's, Minet published a series of morphological papers on the tympanal organs in the Lepidoptera, including the Pyraloidea (1982). Based on the morphologically distinct tympanal organs and the work on larvae by Hasenfuss (1960), Minet proposed elevating two groups, known in the informal sense as Pyraliformes and Crambiformes (Munroe 1972), to Pyralidae and Crambidae. Most workers in the Pyraloidea agree with Minet (e.g., Munroe 1989; Solis & Mitter 1992). Taxonomy is not a static field but a field where new morphological and biological information continually becomes available, and it is necessary to change the classification to reflect this new information. In addition, several major checklists (Munroe et al. 1995; Shaffer et al. 1996) from several major geographic areas have been published in the last ten years with many

new combinations and synonymies. Table 1 gives the current classification of Pyraloidea as an alphabetical list of the taxa treated in this work in the two families by subfamily, with the number of the couplet where they are found in the key for quick retrieval.

DESCRIPTION OF THE KEY AND ITS COMPONENTS

Capps' (1939) description of the function and basis of his key is still applicable today: "The following keys are intended to assist quarantine inspectors in recognizing the lepidopterous larvae most frequently intercepted at ports of entry and are based on the differential characters noted in the literature, and on the larval collection and host catalogue in the United States National Museum." The title of this revision reflects a change from "most frequently" taxa intercepted to "selected" taxa intercepted. I retained all taxa included in Weisman's key even though the species may no longer be intercepted frequently; this in part because the species intercepted depend on the commodities being imported into the U.S. and these species may again be intercepted in the future. The addition of species to this current key is based on the actual interceptions submitted by APHIS port identifiers. Specimens are submitted for identification until the port identifier receives "port authority" for the identification of particular species; and then they no longer send specimens for verification of that species. The top twelve species sent into the SEL (Systematic Entomology Laboratory) for identification in order from more frequent to less frequent during 1998 are: *Ectomyelois ceratoniae*, *Cadra cautella*, *Leucinodes orbonalis*, *Diatraea considerata*, *Spoladea recurvalis*, *Neoleucinodes elegantalis*, *Etiella zinckenella*, *Conogethes* sp., *Pyrausta* sp., *Phidotricha erigens*, *Plodia interpunctella*.

Capps (1939) also wrote: "In using the keys, it should be borne in mind that their validity is dependent on three factors, viz., (1) structure, (2) origin, and (3) host." The origin referred to by Capps indicates the country where the commodity supposedly originated and does not imply evolutionary origin; for this reason Weisman (1986) probably chose to use the term "distribution" rather than "origin." The origin documented by port identifiers is the origin of the vehicle transporting the commodity prior to entering the U.S. The point of origin of the insect could be several ports removed if the vehicle made multiple stops, or entirely outside the vehicle's itinerary if infested cargo was transferred en route.

Further, Capps (1939) wrote: "Moreover, the characters used for separating the families are not completely diagnostic for the entire family but will serve to separate the species treated here." This is emphasized for two reasons: one, the percentage of lepidopterous larvae known is very small, usually only the larval morphology of the pest species in a genus is well known, and hence, the distribution of the characters across taxa are unknown; and two, the loss or reduction of characters in larvae in general is inferred to occur extensively (see also Passoa 1985).

All current taxonomic and phylogenetic information has been incorporated into the revision of this key. Distributions vary according to the information provided with the submitted material and are based specifically on the usage by port identifiers, for example, a country versus an area of a continent. It is stated if the species occurs in Hawaii or a few states in the continental U. S. Changes in distribution in this revision are based on the current literature and unpublished localities in the Pyraloidea collection of the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM). New records in the U.S. are taken into account if there is evidence to support that a population has been established. It is common in certain parts of the U.S. adjoining the Gulf of Mexico to catch one or more adult(s) of a species at light, but this is not evidence that the species is established in the U.S. Specifically, distribution records from Hawaii are from Nishida (1992); it uses three words to reflect residency status: endemic, indigenous, and adventive. I used only adventive when applicable: “immigrant”; used in place of “introduced” to differentiate from those that were purposely introduced. Species that are known only from quarantine records (reported as intercepted) or those considered not established are present in the database, but do not appear in the checklist” (Nishida 1992). The “Old World” includes all land masses except the Western Hemisphere.

The plant names are based primarily on the names given to commodities being imported or brought into the U.S. for any variety of purposes; in this work the biological term “host” and the economic term “commodity” are often one and the same. The names of hosts are either a scientific name or a common name as supplied by port identifiers and checked against Brako, Rossman, and Farr (1995) for U.S. names, and Mabberley (1997) for all other localities and are listed under the “Hosts” section of each species. In the key, the 1998 host records are directly from the SELIS database (Systematic Entomology Laboratory Identification Service) as submitted by port identifiers and listed alphabetically. Pre-1998 records can be from a variety of sources and are primarily those listed in Weisman (1986), with additions from the SELIS database, the USNM larval collection, and are mainly historical records. If the scientific name of a host appeared in both the 1998 list and pre-1998 list, it was removed from the pre-1998 list. The lists of hosts at times lack detail (e.g. “stored vegetable products”) because many pyraloid pest species are highly polyphagous. Table 2 gives the hosts of the pyraloid larvae. If a scientific name for the commodity is given, the table refers to the common name as given by the port identifiers also; scientific names were not generally used prior to the mid-1980’s. The common name is followed by the scientific name in brackets for purposes of cross-indexing.

The “Note” sections comment on a variety of topics that may be useful to the port identifier, it is not meant to be comprehensive: on character variability, explanations of recent nomenclatural changes, nomenclatural method of reporting based on morphological and distributional information available, and relevant literature. The amount of literature available is scattered and very large for pest species, and is less large for geographical works (e.g. Carter 1984; Mutuura et al. 1965). This work does not attempt to review the entirety of the literature, but rather to point to seminal literature that provides relevant information.

HOW TO DISTINGUISH PYRALOIDEA LARVAE

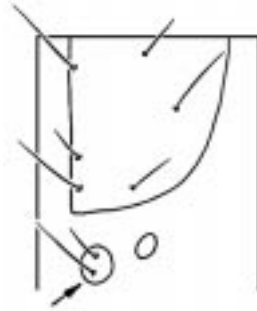
Pyraloidea larvae can be distinguished from other Lepidoptera larvae by a combination of characters. Many “micro” lepidopteran groups have 3 setae in the prespiracular group of the prothorax (Fig. 1), but some may have 2 or 1 (Stehr 1987) and they do not have typical pyraloid crochets (see below). Pyraloids, noctuids, and other “macro” lepidopteran groups have two setae in the prespiracular group of the prothorax (Fig. 2) (Stehr 1987). The Noctuoidea and Carposinidae, two groups that are intercepted frequently and are of importance to port indentifiers, can be confused with pyraloids based on the presence of two setae in the prothoracic prespiracular group. But pyraloids can be distinguished from noctuids because noctuids have the crochets in a mesoseries (Fig. 3), and pyraloids have the crochets in a complete circle or penellipse (Figs. 4-5).

Larvae of the Carposinidae are also confused with pyraloids because they also have two setae in the prespiracular group of the prothorax and crochets in a complete circle. Generally, pyraloids can be separated from carposinids because pyraloids have 3 subventral setae on abdominal segments 3 to 6 (Fig. 6), and carposinids usually have 4 subventral setae (Fig. 7), but the number of subventral setae may vary from segment to segment (see Common 1990). It should be noted here that Weisman (1986) used “the spiracle on abdominal segment 8 well above level of those on preceding segments” to separate them from pyraloids, but many pyraloids have the spiracle on segment 8 above the level of those on the preceding segments.

For recent, more general information on other nearctic pyraloid larvae and lepidopteran larvae and comparisons to other families and other geographic regions see Stehr (1987) and Common (1990).



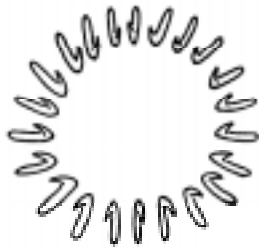
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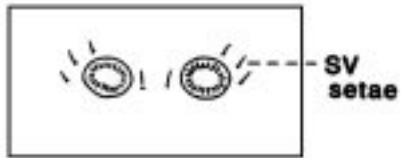
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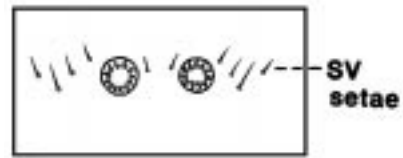
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Table 1. Classification of Pyraloidea (number refers to couplet in the key).

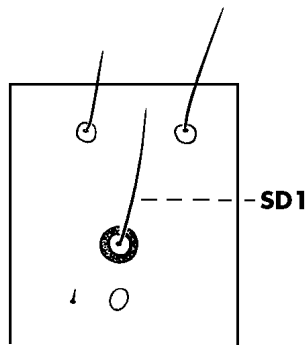
CRAMBIDAE	PYRALIDAE -1
CRAMBINAE	CHRYSAUGINAE - 22
Chilo suppressalis (Walker) - 31	EPIPASCHIINAE
Diatraea sp. - 31	Phidotricha erigens (Ragonot) - 19
Eoreuma loftini (Dyar) -30	GALLERIINAE
EVERGESTINAE	Alpheias conspirata Heinrich - 24
Evergestis rimosalis (Guenée) -37	Corcyra cephalonica (Stainton) - 26
GLAPHYRIINAE	Paralipsa gularis (Zeller) - 26
Hellula rogatalis (Hulst) - 39	Genopaschia protomis Dyar - 24
Hellula phidilealis (Walker) - 39	Trachylepidia fructicassiella Ragonot - 25
NYMPHULINAE	PHYCITINAE
Parapoynx diminutalis Snellen - 27	Amyelois transitella (Walker) - 13
PYRAUSTINAE	Ancylostomia stercorea (Zeller) - 8
PYRAUSTINI	Cadra cautella (Walker) - 17
(or PYRAUSTINAE)	Cadra figulilella (Gregson) - 18
Achyra rantalis (Guenée) - 41	Cadra calidella (Guenée) - 18
Ostrinia nubilalis (Hübner) - 36	Cryptoblabes sp. - 6
Pyrausta sp. - 33	Ectomyelois ceratoniae (Zeller) - 13
SPILOMELINI	Elasmopalpus lignosellus (Zeller) - 6
(or SPILOMELINAE)	Ephestia elutella (Hübner) - 16
Conogethes spp. - 34	Ephestia kuehniella (Zeller) - 16
Diaphania nitidalis (Stoll) - 49	Etiella zinckenella (Treitschke) - 20
Diaphania indica complex - 49	Fundella pellucens Zeller - 10
Hendecasis duplifascialis Hampson - 47	Homoeosoma electellum Hulst - 11
Herpetogramma bipunctalis (Fabricius) - 43	Hypsipyra sp. - 9
Leucinodes orbonalis (Guenée) -50	Moodna bisinuella Hampson - 9
Lineodes integra (Zeller) - 46	Mussidia nigrivenella Ragonot - 4
Loxomorpha flavidissimalis Grote - 41	Plodia interpunctella (Hübner) - 14
Maruca vitrata (Fabricius) - 35	PYRALINAE
Megastes sp. - 35	Pyralis farinalis Linnaeus - 21
Neoleucinodes elegantalis (Guenée) - 50	Aglossa caprealis (Hübner) - 21
Rhectocraspeda periusalis (Walker) - 43	
Spoladea recurvalis Fabricius - 45	
Udea rubigalis (Guenée) - 46	
SCHOENOBIINAE - 28	

Key to Selected Intercepted Pyraloidea Larvae

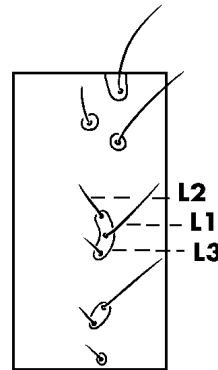
1. Sclerotized ring around seta SD1 on A 8 (missing in a some phycitines) (Fig. 8); three (sometimes two) setae in the L group on A 9 (Fig. 9)**Pyralidae**.....2

Subfamilies: Chrysauginae, Epipaschiinae, Galleriinae, Phycitinae, Pyralinae

Note: Sclerotized rings sometimes hard to see and appear as shiny, unsclerotized rings; 2 L setae in *Etiella zinckenella* (Tr.) and others



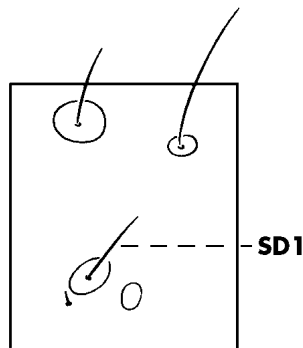
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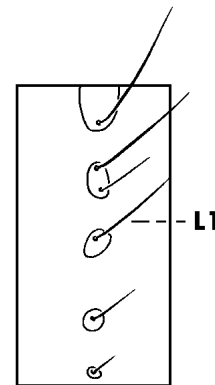
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- No sclerotized ring around seta SD1 on A 8 (Fig. 10); one seta in the L group on A 9 (Fig.11).....**Crambidae**.....27

Subfamilies: Cathariinae, Crambinae, Cybalomiinae, Evergestinae, Glaphyriinae (includes Dichogaminae), Linostinae, Midilinae, Musotiminae, Noordinae, Nymphulinae, Odontiinae, Pyraustinae (includes Spilomelinae), Schoenobiinae, Scopariinae, Wurthiinae

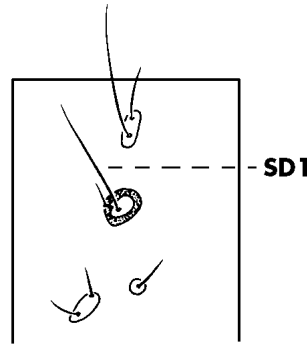


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11

2. Sclerotized ring around seta SD1 on mesothorax, metathorax, or A1 (Fig. 12).....
**Galleriinae, Chrysauginae, Phycitinae**.....3
 Note: Sclerotized ring sometimes absent on these segments, but in taxa not covered in this key (Solis & Mitter 1992)



12

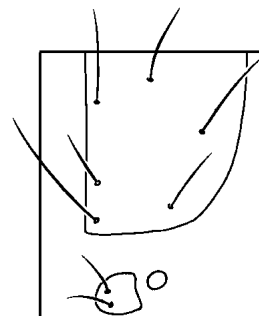
- No sclerotized ring around seta SD1 on mesothorax, metathorax, or A1.....
 **Pyralinae, Epipaschiinae, few Phycitinae**.....19
- 3. Sclerotized ring around seta SD1 of metathorax or A1.....**Chrysauginae, Galleriinae**.....22
- Sclerotized ring around seta SD1 on mesothorax.....**most Phycitinae**.....4
- 4. Sclerotized ring around seta SD1 on A2 to A7..... ***Mussidia nigrivenella*** Ragonot
 Distribution: west tropical Africa; does not occur in the U.S.
 Hosts: 1998: stored seeds
 pre-1998: butter beans, cacao, calabar beans, carob or locust bean, stored grains (cereals)
 Note: see Aitken 1963; Corbet & Tams 1943
- Sclerotized ring around seta SD1 of mesothorax.....**other Phycitinae**.....5

Note: see Hinton 1943; some Phycitinae lack this character, e.g. *Etiella* sp.

- 5. Prespiracular shield of prothorax extending below and behind the spiracle (Fig. 13) or completely enclosing spiracle (Fig. 16).....6
- Prespiracular shield of prothorax never extending below and behind spiracle (Fig.14).....7

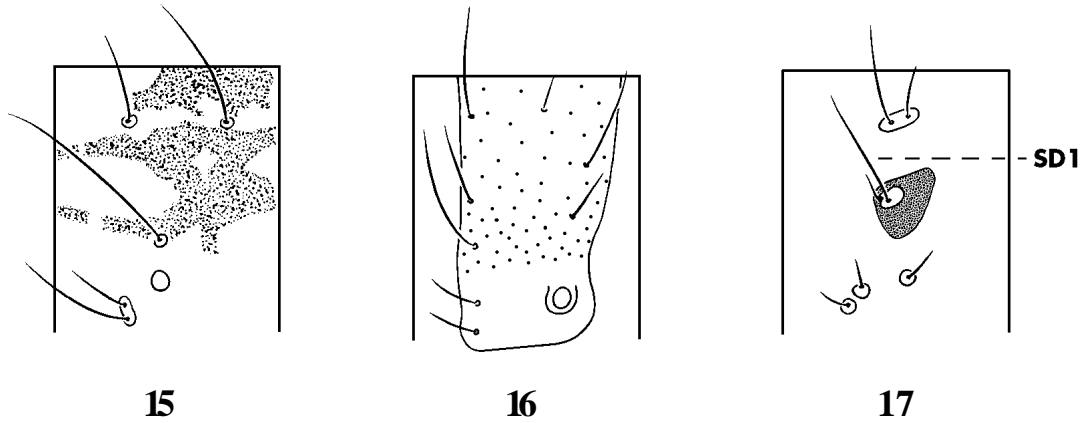


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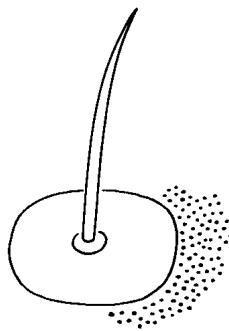
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6. Posterior portion of prespiracular shield weakly pigmented (Fig. 13); body pink with whitish discontinuous longitudinal bands on most segments (Fig. 15); ring around mesothoracic seta SD1 not prominently sclerotized (Fig. 12)..... *Elasmopalpus lignosellus* (Zeller)
 Distribution: Western Hemisphere; adventive in Hawaii
 Hosts: 1998: *Ananas comosus*, *Asparagus officinalis*, *Coffea arabica*, *Corylus avellana*, *Maranta sp.*, *Mentha sp.*, *Mimosa pigra*, *Sida sp.*, *Sorghum sp.*, *Zea mays* (unpopped corn)
 pre-1998: alfalfa, beans, cow peas, Johnson grass, peas, soybeans, strawberries, string beans, sugarcane
 Note: see Heinrich 1956; Luginbill & Ainslie 1917; Neunzig 1979



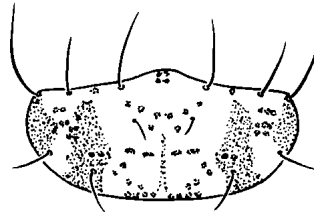
- Prespiracular shield completely enclosing spiracle weakly pigmented (Fig. 16); prominent longitudinal dark bands on all segments; ring around mesothoracic seta SD1 prominently sclerotized (Fig. 17).....*Cryptoblabes sp.*
 Distribution: Europe, Africa, Asia
 Hosts: 1998: *Citrus sinensis*, *Dimocarpus longan*, *Musa sp.*, *Phoenix sp.*, *Psidium guajava*, *Punica granatum*
 pre-1998: *Amaranthus*, *Chaenomeles japonica*, grapes, *Lythrum*, pineapple, raisins, *Tamarix*
 Note: should be reported as “*Cryptoblabes gnidiella* (Millière)” if the origin is from the Western Hemisphere where it was introduced (Heinrich 1956); does not occur in the continental U.S. or Hawaii; see Neunzig 1986

7. Integument granulose under low magnification (30X) (Fig.18).....8



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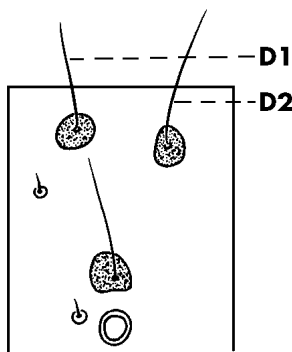
- Integument not granulose under low magnification.....10
- 8. Prothoracic shield with black areas on lateral margins and longitudinal black areas on either side midway between center line and lateral margins (black areas on either side of center line may be very faint) (Fig. 19)..... *Ancylostomia stercorea* (Zeller)
 Distribution: tropical Western Hemisphere including southeastern U.S., Florida to Texas
 Hosts: 1998: *Cajanus cajanus*, *Phaseolus vulgaris*, *Pisum sativum*, *Rumex sp.*
 pre-1998: chickpeas, cow peas
 Note: see Heinrich 1956



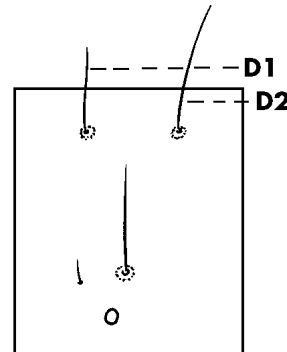
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- Prothoracic shield not with the above color pattern.....9
- 9. Pinacula of body setae large and dark (Fig. 20); seta D2 of A1 to A7 below level of seta D1 (Fig. 20)..... *Hypsipyla sp.*

Distribution: tropical Western Hemisphere including southern Florida
 Hosts:1998: *Zea mays* (unpopped corn)
 pre-1998: crabwood, mahogany, Spanish cedar logs
 Note: see Heinrich 1956; Neunzig 1990



20



21

- Pinacula of body setae very small and pale (fig. 21); seta D2 of A1 to A7 at level of seta D1 (fig. 21).....*Moodna bisinuella* Hampson

Distribution: southern Texas to Mexico, El Salvador
 Hosts: *Zea mays*
 Note: see Heinrich 1956; Neunzig 1990

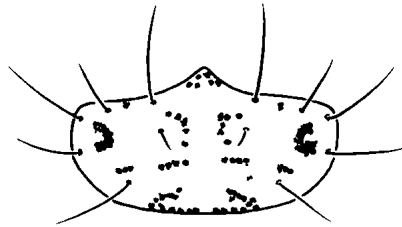
10. Prothoracic shield yellow with pattern of dark marks as illustrated (Fig.22).....
*Fundella pellucens* Zeller

Distribution: tropical Western Hemisphere including Florida

Hosts:1998: *Cajanus cajan*

pre-1998: beans, cow peas, lima beans, peas

Note: see Heinrich 1956



22

- Prothoracic shield yellowish without the pattern as above.....10

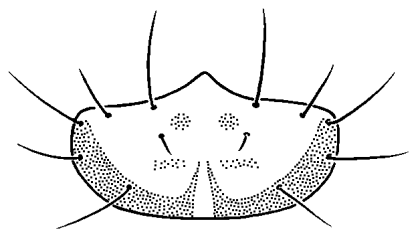
11. Prothoracic shield with black areas on lateral and posterior margins (sometimes without black area on posterior margin) (Fig. 23); prominent longitudinal dark bands on all segments (Fig. 24); head with dark band from ocelli to posterior margin.....
*Homoeosoma electellum* Hulst

Distribution: North and South America

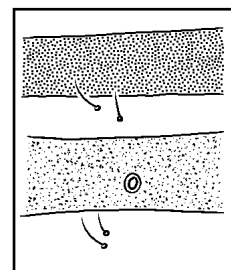
Hosts: 1998: *Bidens sp., Helianthus annuus*

pre-1998: Asteraceae, cotton, oranges

Note: see Heinrich 1956; Neunzig 1997



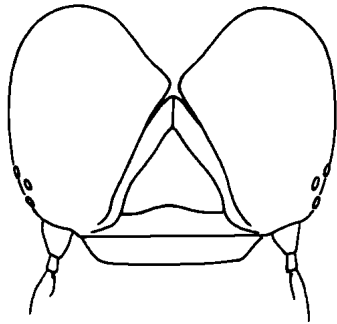
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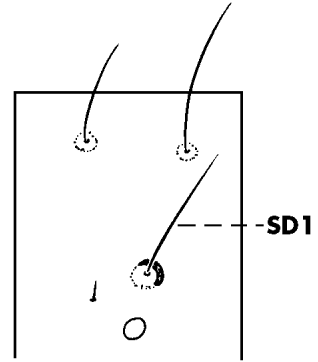
24

- Prothoracic shield yellowish without the pattern as in Fig. 23.....12

12. Coronal suture absent (Fig. 25); A1 to A7 with a crescent-shaped patch above seta SD1 (usually reduced to a small smudge or missing in *Amyelois transitella*) (Fig.26).....13

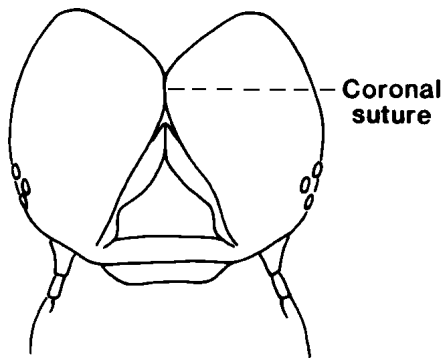


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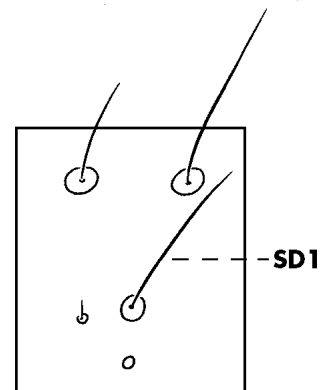


26

- Coronal suture present (Fig.27); A1 to A7 without crescent-shaped patch above seta SD1 (Fig. 28).....14



27



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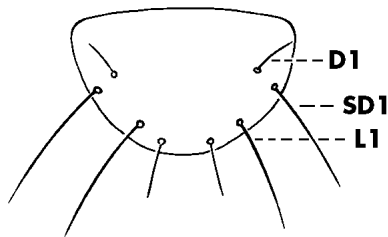
13. Anal plate with seta SD1 closer to seta D1 than to seta L1 (Fig. 29); seta SD2 of A8 usually separated from the spiracle by 2 or more times the diameter of the spiracle (Fig. 30); sclerotized ring around seta SD1 on A8 usually complete (Fig. 30).....
Ectomyelois ceratoniae (Zeller)

Distribution: nearly cosmopolitan including Florida

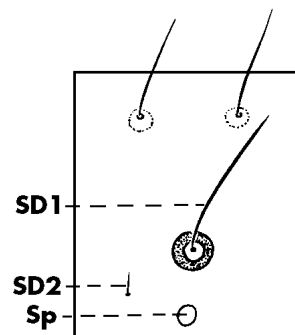
Hosts:1998: *Annona sp.*, *Capsicum sp.*, *Castanea sativa*, *Cereus sp.*, *Chimonanthus sp.*, *Cucurbita sp.*, *Cydonia oblonga*, *Ficus carica*, *Juglans nigra*, *Lansium domesticum*, *Malus sylvestris*, *Mangifera indica*, *Phaseolus sp.*, *Phoenix dactylifera*, *Pithecellobium dulce*, *Prunus avium*, *Psidium guajava*, *Pyrus communis*, *Pyrus pyriflora*, *Punica granatum*, *Sesbania sp.*, *Tamarindus indica*, *Zea mays*

pre-1998: carob or locust bean, dates, legumes, nuts, and others

Note: If the origin is from the tropical areas of the Western Hemisphere it should be reported as “probably *E. decolor* (Zeller)”; see Neunzig 1979, 1990



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30

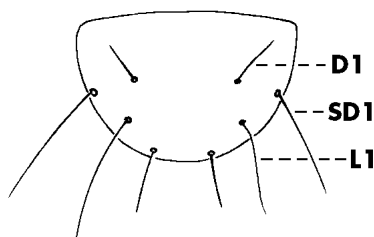
- Anal plate with seta SD1 equidistant from setae D1 and L1 (Fig. 31); seta SD2 of A8 usually separated from the spiracle by one to 1.5 times the diameter of the spiracle (Fig. 32); sclerotized ring around seta SD1 on A8 incomplete (Fig. 32).....
Amyelois transitella (Walker)

Distribution: tropical Western Hemisphere including southern U.S.

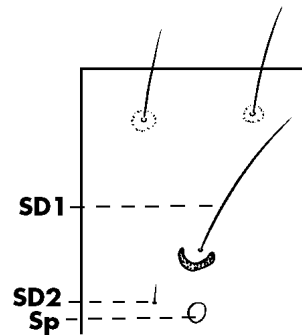
Hosts:1998: none

pre-1998: *Annona sp.*, *Caesalpinia pulcherrima*, *Cajanus cajan*, *Citrus sinensis*, *Cydonia oblonga*, *Juglans sp.*, *Malus sp.*, *Malus sylvestris*, *Mangifera indica*, peach, peony, *Punica granatum*, *Pyrus communis*, *Randia sp.*, *Tamarindus indica*, *Zea mays*, and other fruits and pods

Note: see Neunzig 1990

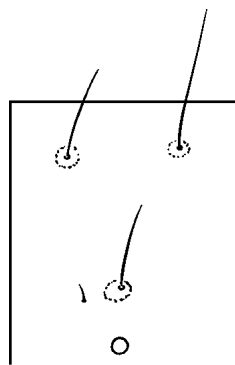


31

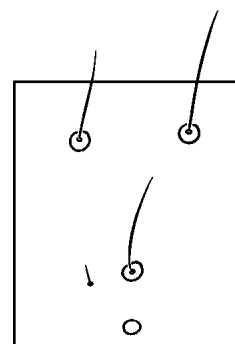


32

14. A1 to A8 apparently without pinacula (pinacula concolorous with body and not evident) (Fig. 33).....*Plodia interpunctella* (Hübner)
 Distribution: cosmopolitan, adventive in Hawaii
 Hosts:1998: *Berberis sp.*, *Camellia sinensis*, *Capsicum sp.*, *Capsicum annuum*, *Castanea sativa*, *Cicer arietinum*, *Ficus carica*, *Gleditsia sp.*, *Morus sp.*, *Oryza sp.*, *Phaseolus sp.*, *Pistacia sp.*, Poaceae, *Prosopis sp.*, *Prunus avium*, *Prunus domestica*, *Prunus persica*, *Punica granatum*, *Vicia faba*, *Vitis sp.*, *Ziziphus jujuba*
 pre-1998: stored fruit, grain, and vegetable products
 Note: see Neunzig 1990
- A1 to A8 with small pigmented pinacula (Fig. 34).....15

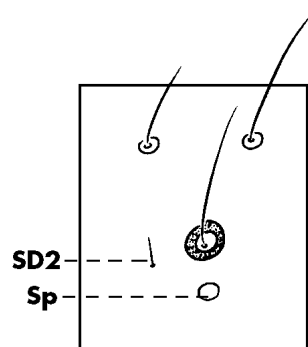


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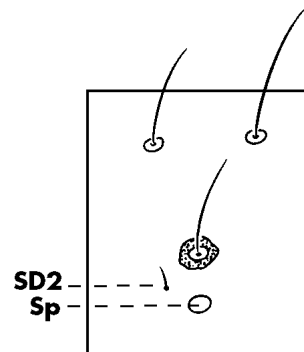


34

15. A8 with seta SD2 separated from spiracle by 2 to 3 times the horizontal diameter of the spiracle (Fig. 35).....16
- A8 with seta SD2 separated from spiracle by a distance equal to the horizontal diameter of the spiracle (Fig. 36).....17



35



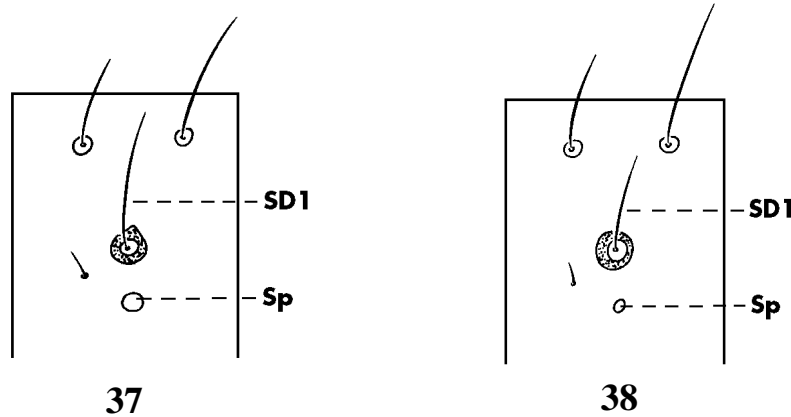
36

16. Spiracle of A8 as large as the area enclosed by the sclerotized ring around seta SD1 (Fig.37)
*Ephestia kuehniella* (Zeller)

Distribution: nearly cosmopolitan; does not occur in Hawaii
 Hosts:1998: *Annona sp.*, *Dennettia sp.*, *Chrysophyllum sp.*, *Moringa oleifera*
 pre-1998: stored grain, stored and dried vegetable products
 Note: see Neunzig 1990

- Spiracle of A8 two-thirds or less as broad as the area enclosed by the sclerotized ring around seta SD1 (Fig. 38).....*Ephestia elutella* (Hübner)

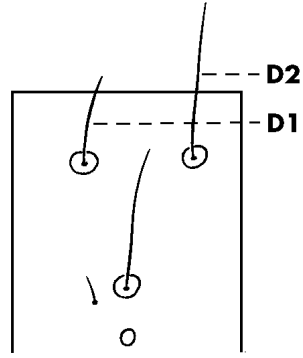
Distribution: Nearly cosmopolitan; does not occur in Hawaii
 Hosts: 1998: *Acanthocereus sp.*, *Allium sp.*, *Brassica sp.*, *Capsicum sp.*, *Castanea sp.*,
 cereal products, *Juglans nigra*, *Medicago sativa*, *Oryza sativa*, *Protea sp.*,
Prunus sp., *Prunus avium*, *Punica granatum*, *Vitis sp.*
 pre-1998: stored and dried vegetable products
 Note: see Neunzig 1990; early instars with partial sclerotization of SD1 ring A1 to A7



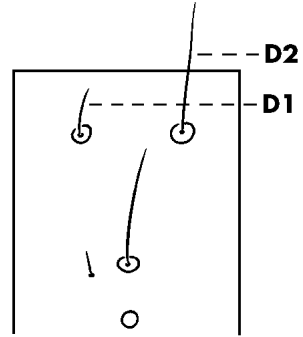
17. Seta D2 of A1 to A 8, two to two and one-half times the length of seta D1 (Fig. 39)
*Cadra cautella* (Walker)

Distribution: cosmopolitan, adventive in Hawaii
 Hosts:1998: *Allium sativum*, *Anacardium sp.*, *Ananas comosus*, *Arachis hypogaea*, *Areca sp.*, *Bambusa sp.*, *Berberis sp.*, *Capsicum sp.*, *Carica papaya*, *Citrus sp.*,
Coffea arabica, *Cucurbita sp.*, *Guizotia abyssinica*, *Morus sp.*, *Oryza sativa*, *Phaseolus sp.*, *Phoenix dactylifera*, *Pisum sativum*, *Pithecellobium dulce*, *Prunus avium*, *Psidium guajava*, *Pyrus communis*, *Rosa sp.*, *Rubus sp.*,
Sesamum indicum, *Tamarindus sp.*, *Theobroma cacao*, *Vaccinium sp.*, *Zea mays*
 pre-1998: stored and dried vegetable products
 Note: see Neunzig 1990

- Seta D2 of A1 to A8, three to five times the length of seta D1 (Fig. 40).....18



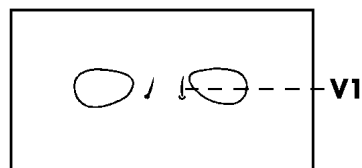
39



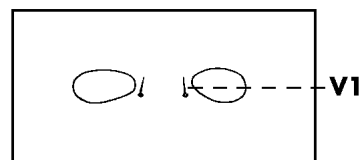
40

18. Metathorax with the distance between setae V1 2 times or less than the distance between seta V1 and the coxa (Fig. 41).....*Cadra figulilella* (Gregson)
 Distribution: nearly cosmopolitan; occurring in the continental U.S. and adventive in Hawaii
 Hosts:1998: *Allium sativum*, *Capsicum sp.*, *Castanea sativa*, *Ficus sp.*, *Ficus carica*, *Manihot esculenta*, *Morus sp.*, *Phoenix dactylifera*, *Prunus sp.*, *Prunus avium*, *Psidium guajava*, *Saccharum officinarum*
 pre-1998: dried beans, fruits, nuts, and seeds
 Note: see Neunzig 1990

- Metathorax with the distance between setae V1 3 to 5 times the distance between seta V1 and the coxa (Fig. 42).....*Cadra calidella* (Guenée)
 Distribution: Mediterranean; does not occur in the U.S
 Hosts: 1998: *Castanea sp.*, *Ceratonia siliqua*, dried foodstuffs, *Ficus sp.*, *Ficus carica*, *Morus sp.*, *Phoenix sp.*, *Prunus sp.*,
 pre-1998: dried fruit and nuts, *Plectranthus sp.* (seed), *Vitis vinifera*
 Note: see Aitken 1963

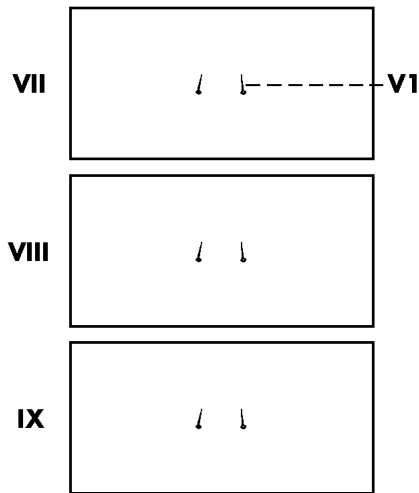


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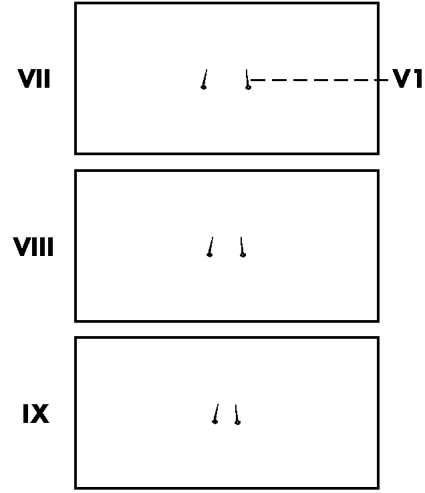


42

19. V1 on abdominal segment 7 as far apart as on segment 9 (Fig. 43); body without longitudinal dark bands.....**Phycitinae, Pyralinae**.....20

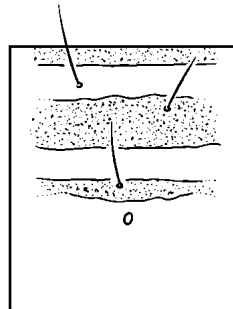


43



44

- V1 on abdominal segment 7 twice as far apart as on segment 9 (Fig. 44); body with longitudinal dark bands (Fig. 45).....**Epipaschiinae, Phidotricha erigens** (Ragonot)
 Distribution: tropical Western Hemisphere including southern Florida
 Hosts:1998: *Benincasa hispida*, *Mammea sp.*, *Mimosa pigra*, *Petiveria alliacea*, *Zea mays*, *Zingiber sp.*
 pre-1998: cotton, lima beans, loquats, mangos, sorghum, tamarinds
 Note: misidentified in the literature as *Pococera atramentalis* Lederer (Solis 1993); see Allyson 1977



45

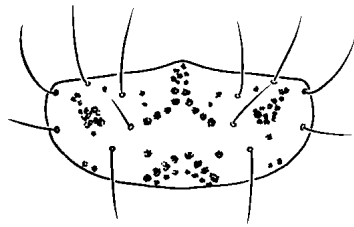
20. Prothoracic shield with pattern of dark markings as illustrated (Fig. 46).....
.....**Phycitinae, *Etiella zinckenella*** (Treitschke)

Distribution: nearly cosmopolitan; does not occur in Hawaii

Hosts:1998: *Cajanus cajan*, *Capsicum annuum*, *Castanea sativa*, *Cicer arietinum*,
Cucurbita sp., *Cydonia oblonga*, *Lablab purpureus*, *Opuntia sp.*, *Parkia sp.*,
Phaseolus lunatus, *Phaseolus vulgaris*, *Pisum sativum*, *Solanum tuberosum*,
Zea mays

pre-1998: legumes and other stored vegetable products

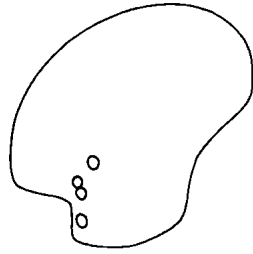
Note: because several immatures of species are indistinguishable, it should be reported as “*Etiella* sp.” if the origin is southeast Asia; markings on prothorax can be more or less distinct



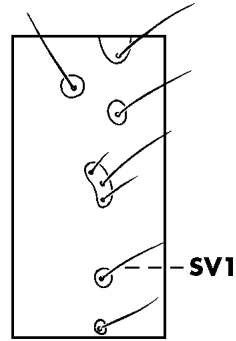
46

- Prothoracic shield not patterned as above.....21

21. Head with only 4 distinct ocelli (ocelli I and II fused and ocellus VI usually missing) (Fig. 47); A9 with one subventral seta (Fig. 48).....*Pyralis farinalis* Linnaeus
 Distribution: nearly cosmopolitan, does not occur in Hawaii
 Hosts:1998: *Allium sp.*, foodstuffs, *Narcissus tazetta*, packing
 pre-1998: dried vegetable products
 Note: the packing is usually associated with polished monuments, marble blocks, and tiles in wood crates

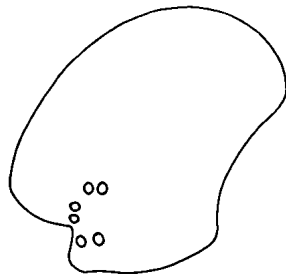


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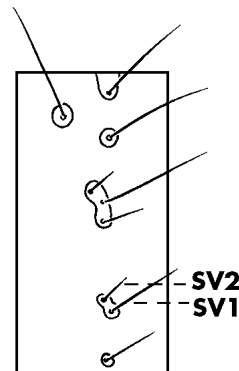


48

- Head with 6 ocelli (Fig. 49); A9 with two subventral setae (Fig.50).....*Aglossa caprealis* (Hübner)
 Distribution: Nearly cosmopolitan, does not occur in Hawaii
 Hosts:1998: *Allium sativum*
 pre-1998: damp grain and rotting vegetable matter, *Nephelium lappaceum*, packing in crates, *Persea americana*



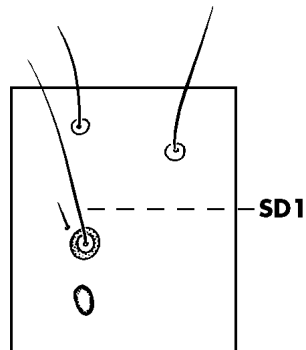
49



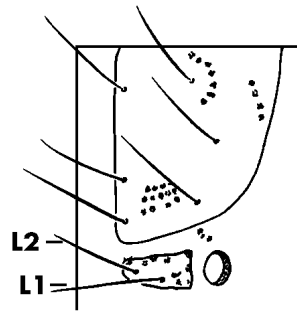
50

22. Sclerotized ring around seta SD1 of metathorax (Fig. 51).....**Chrysauginae**

- Sclerotized ring around seta SD1 of A1 (Fig. 51).....**Galleriinae**.....23



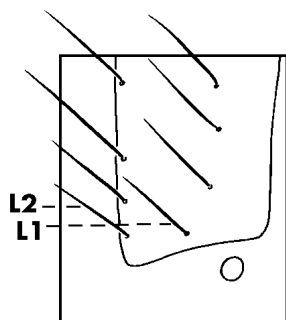
51



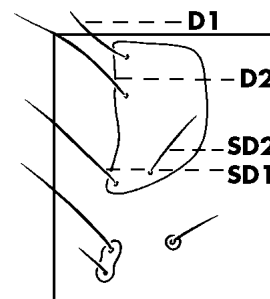
52

23. Prespiracular and prothoracic shields entirely fused (Fig. 53).....24

- Prespiracular and prothoracic shields not fused (Fig. 54).....25



53



54

24. Sclerotized rings around seta SD1 on A2 to A7 in addition to A1 and A8.....
 ***Alpheias conspirata*** Heinrich

Distribution: Mexico

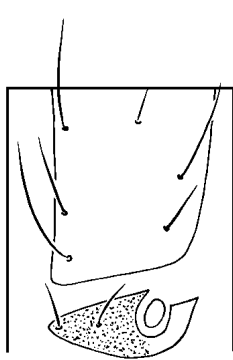
Hosts: *Ananas comosus*

- No sclerotized rings around seta SD1 on A2 to A7; sclerotized rings around A1 and A8 only
 ***Genopaschia protomis*** Dyar

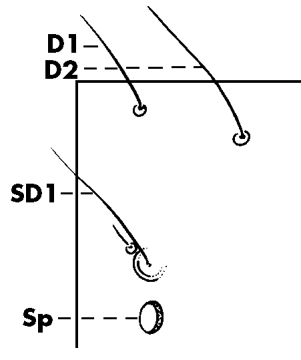
Distribution: Panama

Hosts: *Ananas comosus*

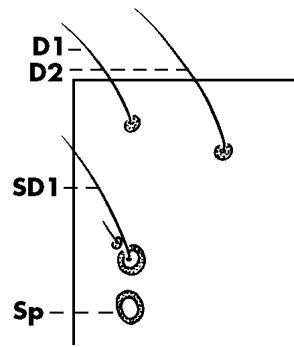
25. Prespiracular shield of prothorax not extending below and behind spiracle (Fig. 52).....26
- Prespiracular shield of prothorax extending below and behind the spiracle (Fig. 55).....
.....*Trachylepidia fructicassiella* Ragonot
Distribution: pantropical
Hosts:1998: *Cassia sp.*, *Cassia fistula*, *Cassia grandis*, dried vegetable products, *Vigna sp.*
pre-1998: *Inga*
26. Sclerotized ring around seta SD1 on A1 and A8 not complete (Fig. 56); spiracular peritreme thicker on caudal margin (Fig. 56); pinacula of setae D1 and D2 on abdominal segments not pigmented (Fig. 56).....*Corcyra cephalonica* (Stainton)
Distribution: cosmopolitan
Hosts: 1998: *Brassica sp.*, *Guazuma ulmifolia*, *Lens sp.*, *Oryza sp.*, *Oryza sativa*, *Triticum sp.*
pre-1998: *Abelmoschus esculentus*, *Acacia sp.*, *Arachis sp.*, *Cassia sp.*, cocoa beans, coffee, *Cola sp.*, *Cuminum sp.*, *Inga sp.*, *Phaseolus vulgaris*, *Sesamum indicum*, *Sorghum sp.*, stored vegetable products
- Sclerotized rings around seta SD1 on A1 and A8 complete (Fig. 57); spiracular peritremes of uniform thickness (Fig. 57); pinacula of setae D1 and D2 on abdominal segments pigmented (Fig. 57)*Paralipsa gularis* (Zeller)
Distribution: nearly cosmopolitan, adventive in Hawaii
Hosts: 1998: *Capsicum annuum*, *Nephelium lappaceum*, *Phoenix dactylifera*, *Rhododendron sp.*, *Zea mays*
pre-1998: *Ananas comosus*, *Areca catechu*, *Bambusa sp.*, *Calophyllum brasiliense*, *Cassia sp.*, *Castanea sp.*, *Ceratonia siliqua*, dunnage, *Elasis sp.* *Lansium domestica*, *Oncidium sp.*, papyrus, *Punica granatum*, *Solanum sp.*, *Stirlingia sp.*, stored vegetable products



55

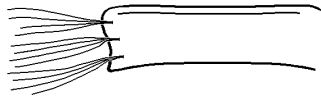


56



57

27. Lateral gills on body segments (Figs. 58, 59).....**Nymphulinae**.....*Parapoynx* sp.
 Distribution: southeastern Asia, Africa, Australia, Europe, U.S.
 Hosts: 1998: *Hygrophila* sp., *Vallisneria* sp.
 pre-1998: *Cabomba* sp., *Hydrilla* sp., *Limnophila* sp., *Myriophyllum* sp.
 Note: Fig. 59 is an enlargement of one lateral gill, note base; *P. fluctuosalis* is
 adventive in Hawaii; see Goater 1986

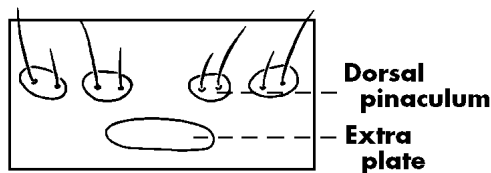


58

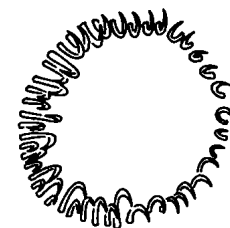


59

- Without lateral gills.....28
28. With membranous sac or gibbosity anterior to prothoracic coxae.....**Schoenobiinae**
 Hosts:1998: *Typha latifolia*
 pre-1998: *Pistia stratiotes*
 Note: for further information on this group see Passoa (1987) and Stehr (1987)
- Without membranous sac or gibbosity anterior to prothoracic coxa.....29
29. A single transverse plate posterior to dorsal pinacula on mesothorax (Fig. 60); crochets in complete circle (Fig. 61)**Crambinae**.....30



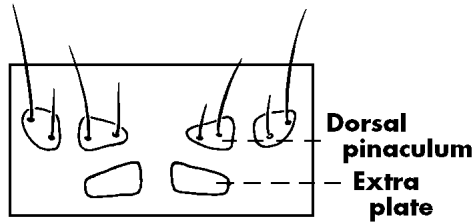
60



61

- A pair of transverse plates posterior to dorsal pinacula on mesothorax (Fig. 62) or plates absent; crochets in a mesal penellipse (Fig. 63) (or may be a circle weaker on lateral edge in *Lineodes integra* and *Udea rubigalis*) (Figs. 91, 93)
**Pyraustinae, Glaphyriinae, Evergestinae**.....32

Note: Unless otherwise stated, the taxa following couplet 31 are **Pyraustinae**



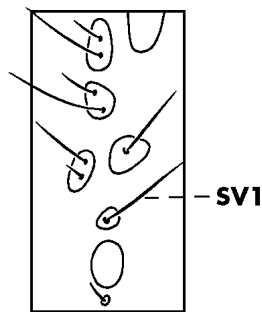
62



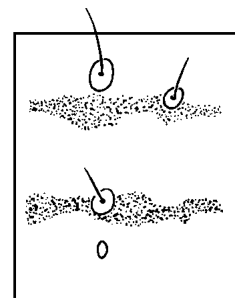
63

- 30. One subventral seta on meso- and metathorax (Fig. 64); body with 2 pink longitudinal stripes on each side (Fig. 65); pink-pigmented area around lateral setae on proleg-bearing segments.....***Eoreuma loftini*** (Dyar)
 Distribution: Mexico and United States
 Hosts:1998: *Cymbopogon citratus*, *Saccharum officinarum*
 pre-1998: corn, millet, rice, sorghum
 Note: one SV seta also occurs in *Crambus*; see Rodriguez-del-Bosque et al. 1990

- Two subventral setae on meso- and metathorax (Fig.66); body with or without pigmented stripes; no pigmented area around lateral setae on proleg-bearing segments.....31

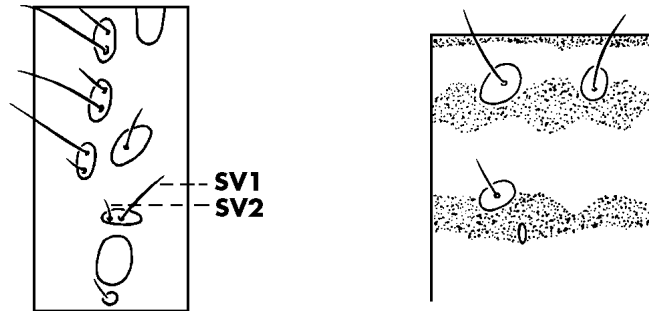


64



65

31. Body with pinkish middorsal stripe and two lateral stripes on each side (Fig. 67); setal pinacula concolorous with body.....*Chilo suppressalis* (Walker)
 Distribution: Europe, Middle East, Southeast Asia to India, Oceania; adventive in Hawaii
 Hosts: 1998: *Cymbopogon citratus*
 pre-1998: cabbage, corn, eggplant, millet, rice straw, sugarcane, sorghum, tomatoes, and wheat, many others
 Note: see Bleszynski 1970; Meijermann & Ulenberg 1996; Whittle & Ferguson 1988



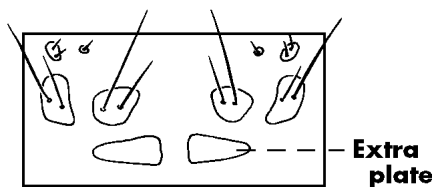
66

67

- Body with or without lateral stripes, but without pinkish middorsal stripe; setal pinacula concolorous with body (winter form) or darkly pigmented (summer form)....*Diatraea* spp.
 Distribution: tropical Western Hemisphere including southern U.S.
 Hosts: 1998: *Musa sp.*, *Saccharum officinarum*, *Zea mays*
 pre-1998: rice, sorghum
 Note: Some species of *Chilo* will key to *Diatraea* based on color pattern (Passoa, pers. comm.), but *Diatraea* does not occur in the Old World; see Box 1931; Dyar & Heinrich 1927

32. Meso- and metathorax without nonsetal bearing plates posterior to dorsal pinacula.....33

- Meso- and metathorax with a pair of nonsetal bearing plates posterior to dorsal pinacula (Fig. 68).....34



68

33. Small pinacula anterior to dorsal and subdorsal pinacula bearing microscopic setae on meso- and metathorax (also occurring in *L. orbonalis*, see couplet 50) (Fig. 68).....
*Pyrausta* sp.

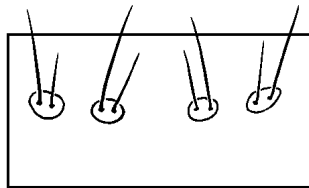
Distribution: cosmopolitan

Hosts: 1998: *Allium cepa*, *Citrullus lanatus*, *Mentha* sp., *Momordica charantia*, *Ocimum* sp., *Ocimum basilicum*, *Origanum* sp., *Thymus* sp., *Thymus vulgaris*

pre-1998: *Amaranthus* sp.

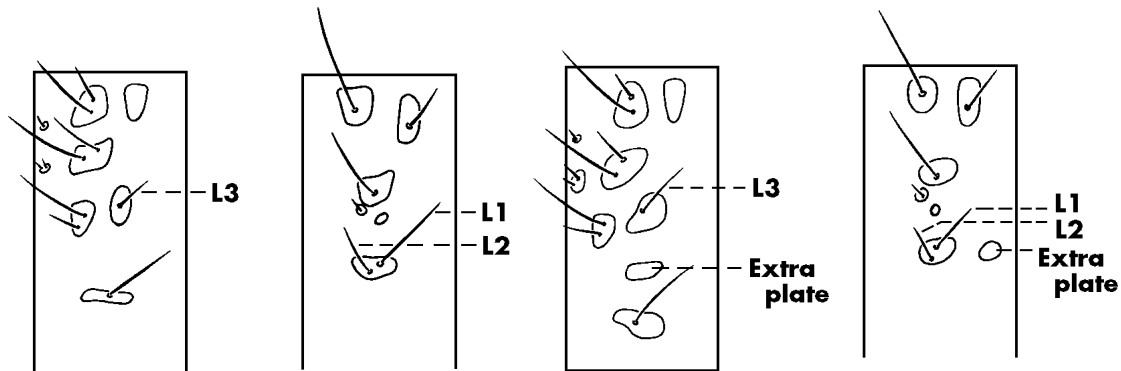
Note: According to Allyson (1981b) last instar larvae are characterized by 2 or 3 SV setae on A1, prothoracic shield lightly pigmented, pinacula below spiracles with paler pigmentation than those above spiracles, body at most 20 mm long; although the genus is cosmopolitan, most of the interceptions on the host plants are from the tropical Western Hemisphere

- No small pinacula anterior to dorsal and subdorsal pinacula (Fig. 69).....36



69

34. No extra nonsetal bearing plate below seta L3 on meso- and metathorax (Fig. 70) and behind L1 and L2 on abdominal segments 1 to 7 (Fig. 71).....35



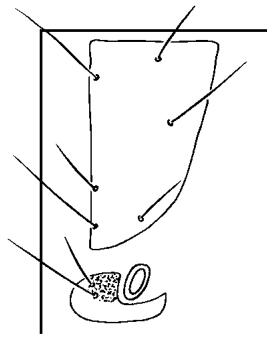
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71

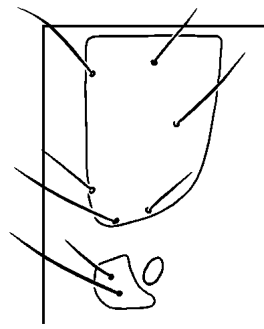
72

73

- An extra nonsetal bearing plate below seta L3 on meso- and metathorax (Fig. 72) and behind L1 and L2 on A1 to A7 (Fig. 73).....*Conogethes* spp.
 Distribution: southeast Asia, including India and Pakistan, Australia; does not occur in Hawaii
 Hosts: *Castanea sp.*, *Dimocarpus longan*, *Gardenia sp.*, *Nephelium lappaceum*, *Psidium guajava*, *Pyrus communis*, *Syzygium malacense*
 pre-1998: *Catalpa*, peach, pine
 Note: prespiracular shield of prothorax extending below and beyond spiracle (Fig. 74); this species was known as *Dichocrocis punctiferalis* (Guenée); *C. punctiferalis* is a complex of species (unpublished).

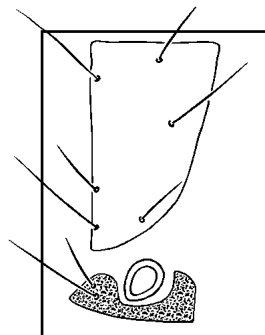


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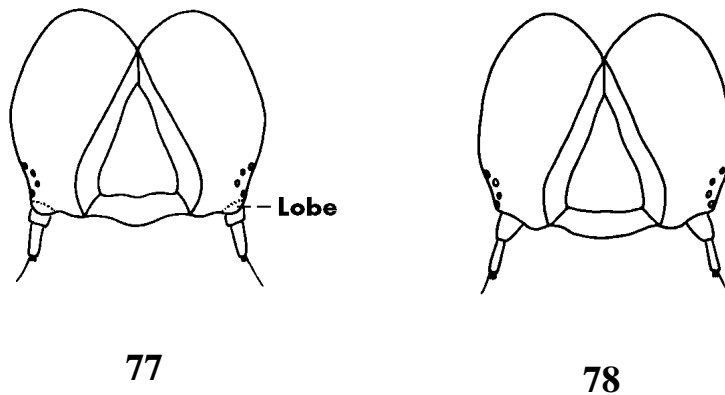
75

- 35. Prespiracular shield of prothorax crescent shaped extending below spiracle (Fig. 75).....*Maruca vitrata* (Fabricius)
 Distribution: Africa, Asia, Australia, Mexico to South America, adventive in Hawaii
 Hosts: 1998: *Phaseolus lunatus*, *Phaseolus vulgaris*, *Vigna sp.*
 pre-1998: beans, legumes, peas, pigeon peas
 Note: this species was known as *Maruca testulalis* (Geyer), synonymized by Munroe et al. 1995; there are a few records of adults captured in the southern U.S.; see also Ferguson, not dated



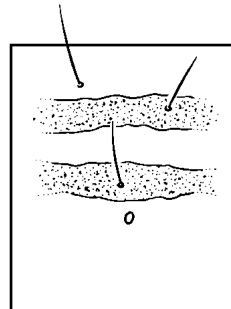
76

- Prespiracular shield of prothorax extending below and behind spiracle (Fig. 76).....
*Megastes* sp.
 Distribution: West Indies
 Host: sweet potato
- 36. Head capsule with a lobelike extension over base of antenna (Fig.77).....
*Ostrinia nubilalis* (Hübner)
 Distribution: Europe and United States
 Hosts: 1998: *Capsicum* sp., *Malus* sp., strawberries, *Zea mays*
 pre-1998: beans, beets, celery, clover, cucumbers, eggplant, lettuce, peas, potatoes,
 rhubarb, string beans, tomatoes, wheat
 Note: see Heinrich 1919; Allyson 1981b
- Head capsule without a lobelike extension over base of antenna (Fig. 78).....37



- 37. Dorsal and subdorsal setae of the abdominal segments on strongly conical black chalazae
*Evergestinae, Evergestis rimosalis* (Guenée)
 Distribution: Western Hemisphere
 Hosts: 1998: *Brassica* sp.
 pre-1998: Brassicaceae, including cabbage, brussel sprouts, cauliflower, watercress
 Note: it should be reported as “probably *E. forficalis* (L.)” if the origin is Europe;
 see Munroe 1973
- Abdominal segments without conical black chalazae.....38

38. Body with pinkish longitudinal stripes (Fig. 79).....39
 - Body without pinkish longitudinal stripes.....40



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39. Head blackish or brownish with whitish areas along adfrontal sutures extending to vertex, seta O3 anterior to a line joining setae L1 and O2 (Fig. 80).....
**Glaphyriinae, *Hellula rogatalis*** (Hulst)

Distribution: Western Hemisphere; does not occur in Hawaii

Hosts: *Brassica oleracea*, *Brassica rapa*

pre-1998: mustard, radish, other Brassicaceae

Note: should be reported as “probably *H. undalis* (F.)” if the origin is the Old World; see Munroe 1972; Allyson 1981a

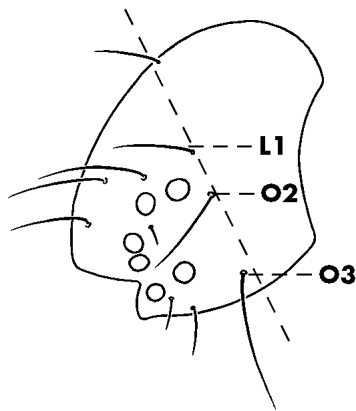
- Head pale, mottled, area along adfrontal sutures pale but not white, seta O3 posterior to a line joining setae L1 and O2 (Fig. 81).....**Glaphyriinae, *Hellula phidilealis*** (Walker)

Distribution: Western Hemisphere; adventive in Hawaii

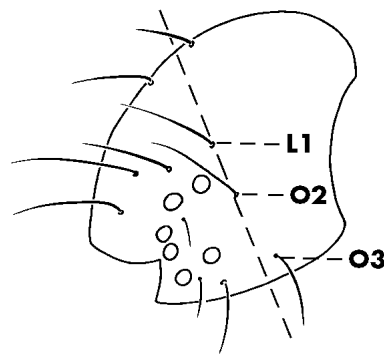
Hosts: *Brassica sp.*, *Brassica oleracea*, *Brassica pekinensis*, *Brassica rapa*,
Raphanus sativus, *Spinacia oleracea*

pre-1998: white chard, and other Brassicaceae

Note: see Munroe 1972

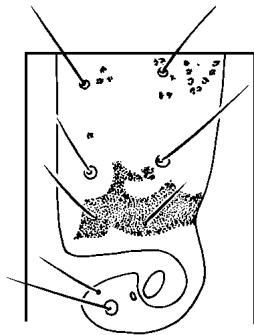


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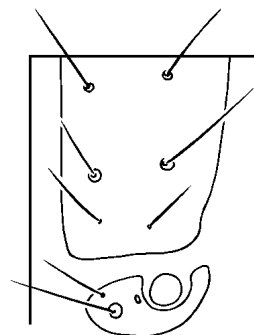


81

40. Prespiracular shield of prothorax extending below and behind spiracle (Figs. 82, 83).....41
- Prespiracular shield of prothorax not extending below and behind spiracle, but may completely enclose the spiracle (Figs.85, 87).....42
41. Prothorax with sclerotization extending from posterolateral margin of prothoracic shield behind and below spiracle to prespiracular shield (Fig. 82).....*Achyra rantalis* (Guenée)
 Distribution: Mexico, West Indies, and United States
 Hosts: *Medicago sativa*, *Rosa sp.*, *Sesuvium sp.*
 pre-1998: beets, cotton, soybeans, and many others
 Note: see Allyson 1976, 1981b

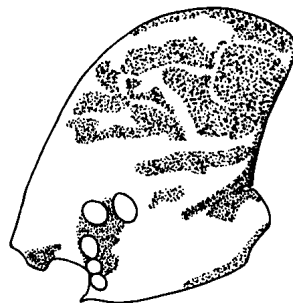


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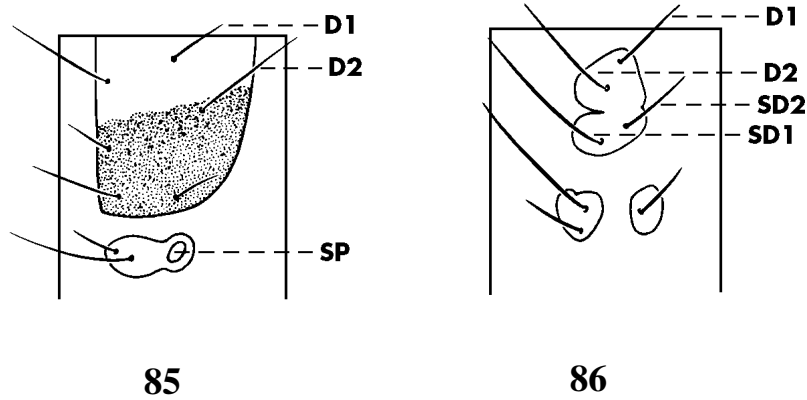
83

- Prespiracular shield of prothorax extending below and behind spiracle, not fused with posterolateral margin of prothoracic shield (Fig. 83).....*Loxomorpha flavidissimalis* Grote
 Distribution: Mexico
 Hosts: cactus
42. Head yellow with dark pattern (Fig. 84); prothoracic shield broadly shaded laterally (Figs. 85, 87).....43
- Head not patterned; prothoracic shield without dark shading laterally.....44



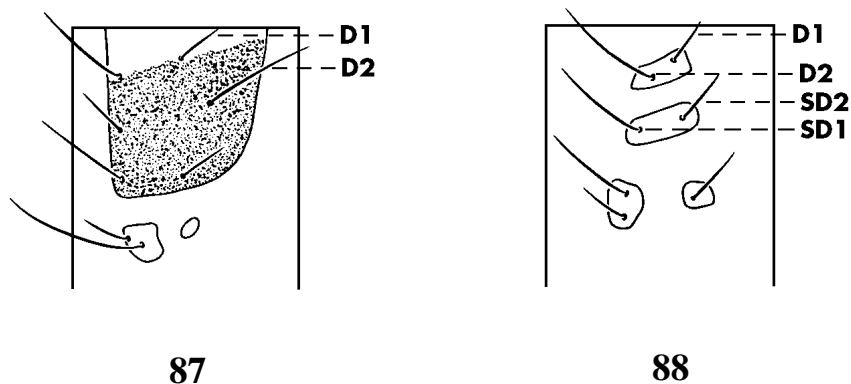
84

43. Prespiracular shield enclosing the spiracle (Fig. 85); A1 with SV trisetose; prothoracic shield with dark lateral shading extending to seta D2 (Fig. 85); dorsal and subdorsal pinacula of mesothorax fused (sometimes not fused in early instars) (Fig. 86).....
*Herpetogramma bipunctalis* (Fabricius)
 Distribution: Western Hemisphere
 Hosts: 1998: *Amaranthus sp.*, *Amaranthus caudatus*, *Corchorus olitorius*, *Gomphrena sp.*,
Jatropha sp., *Spinacia sp.*, *Strobilanthes sp.*, *Xanthosoma brasiliense*
 pre-1998: alfalfa, beets, cotton, soybeans
 Note: see Allyson 1984

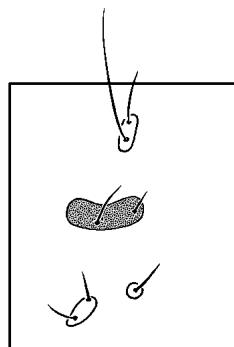


- Prespiracular shield not enclosing the spiracle (Fig. 87); A1 with SV setae bisetose; dorsal and subdorsal pinacula of mesothorax usually not fused (Fig. 88).....
*Rhectocraspeda periusalis* (Walker)
 Distribution: West Indies and United States
 Hosts:1998: *Amaranthus sp.*, *Momordica charantia*, *Strobilanthes sp.*
 pre-1998: Solanaceae, including eggplant, potatoes, and tomatoes
 Note: *Pilemia* Möschler is a junior synonym of *Rhectocraspeda* Warren, new combination in Munroe et al. 1995

44. Prothoracic shield with at least one dark reniform spot posterior to seta XD2 (Figs. 90, 92).....45
 - Prothoracic shield without dark reniform spot posterior to seta XD2.....47

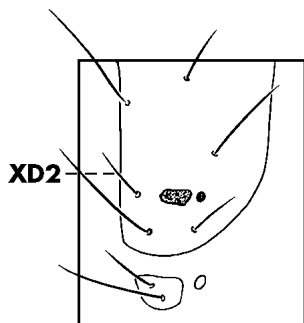


45. D1 and D2 on mesothorax on the same sclerotized pinaculum (Fig. 89).....
*Spoladea recurvalis* Fabricius
 Distribution: cosmopolitan, adventive in Hawaii
 Host: 1998: *Amaranthus sp.*, *Amarantus recurvalis*, *Celosia sp.*, *Chrysanthemum sp.*,
Colocasia sp., *Eryngium foetidum*, *Eupatorium sp.*, *Impatiens sp.*, *Jatropha*
curcas, *Mentha sp.*, *Phytolacca americana*, *Polygonum perfoliatum*, *Spinacia*
sp., *Spinacia oleracea*, *Xanthosoma sp.*, *Zea mays*
 pre-1998: Amaranthaceae, Areca palm, Asteraceae, beets, Chenopodiaceae, soybeans,
 swiss chard
 Note: see Allyson 1984
- D1 and D2 on mesothorax on separate, unsclerotized pinacula.....46

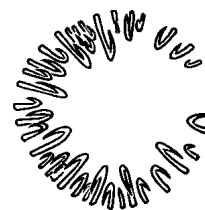


89

46. Prespiracular shield ovate (Fig. 90); crochets triordinal on mesal aspect (Fig. 91)
*Udea rubigalis* (Guenée)
 Distribution: Canada south to Costa Rica
 Hosts: *Amaranthus sp.*, *Ipomoea sp.*, *Mentha sp.*, *Ocimum sp.*, *Ocimum basilicum*,
Pimenta dioica, *Raphanus sativus*, *Spinacea oleracea*,
 pre-1998: alfalfa, cabbage, celery, *Chrysanthemum*, clover, cucumbers, lettuce, peas,
 roses, sugar beets, sweet potato
 Note: should be reported as “probably *Udea ferrugalis* (Hübner)” if the origin is
 Europe; see Allyson 1984

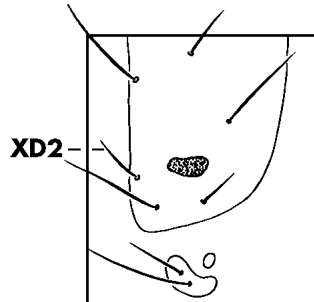


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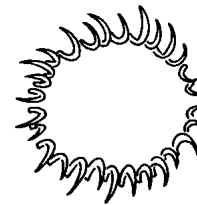


91

- Prespiracular shield crescent shaped extending below spiracle (Fig. 92); crochets biordinal on mesal aspect (Fig. 93).....*Lineodes integra* (Zeller)
 Distribution: United States, Mexico, El Salvador, Peru, West Indies
 Hosts:1998: *Capsicum sp.*, *Lycopersicon lycopersicon*, *Physalis ixocarpa*, *Physalis peruviana*, *Solanum torvum*
 pre-1998: Solanaceae, including eggplant

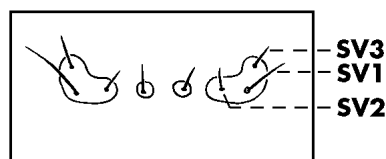


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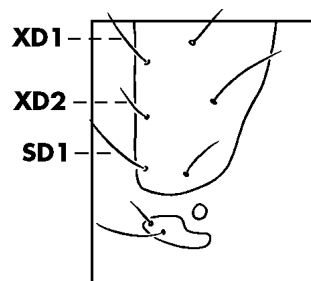


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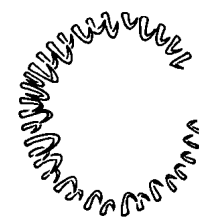
- 47. A1 with three subventral setae (Fig.94); prothorax with seta XD2 equidistant from setae SD1 and XD1 (Fig. 95); crochets biordinal (Fig. 96).....*Hendecasis duplifascialis* Hampson
 Distribution: southeastern Asia, does not occur in Hawaii
 Host: 1998: *Dianthus sp.*, *Gardenia sp.*, *Jasminium sambac*, Orchidaceae, *Plumeria rubra*, *Polianthes tuberosa*
 pre-1998: jasmine



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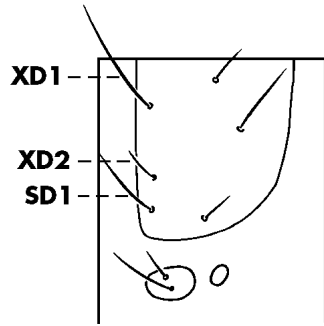


95



96

- A1 with less than three subventral setae (Figs. 99, 101); prothorax with seta XD2 closer to seta SD1 than to seta XD1 (Fig. 97); crochets triordinal (Fig. 98).....48

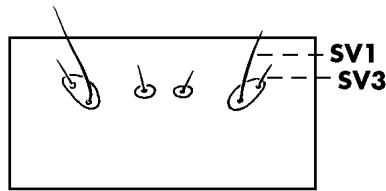


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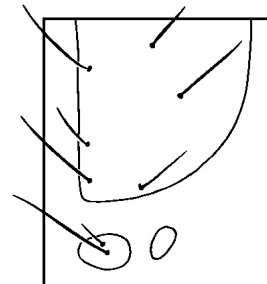


98

- 48. A1 with two subventral setae (Fig. 99); prespiracular shield oblong (Fig. 100); pinaculum of seta D1 on A 2 to A 8 without dark spot on anterior margin (Fig. 103).....49

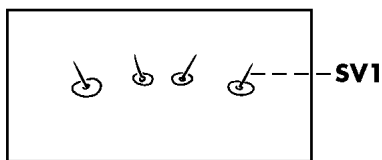


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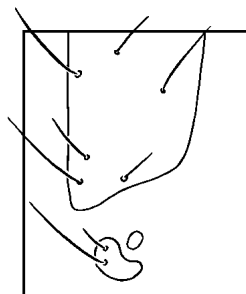


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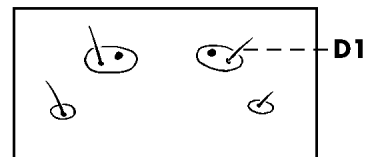
- A1 with one subventral seta (Fig. 101); prespiracular shield crescent shaped, may extend under spiracle (Fig. 102); pinaculum of seta D1 on A 2 to A 8 with dark spot on anterior margin (Fig. 103) (dark spot can appear very shiny white after preservation)50



101



102



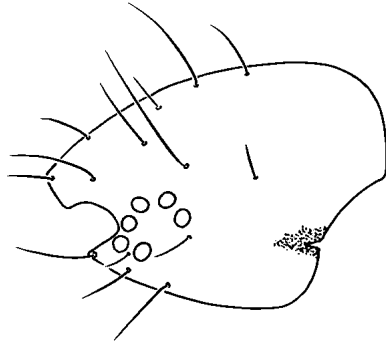
103

49. Head with a pigmented spot at genal angle (Fig. 104); mandible without a projection on lateral margin (Fig. 105); pinacula dark on early instars, pale in later instars.....
*Diaphania nitidalis* (Cramer)

Distribution: Tropical worldwide

Hosts: 1998: *Cucumis* sp., *Cucumis melon*, *Cucumis sativus*, *Cucurbita* sp., *Cucurbita pepo*, *Sechium edule*

pre-1998: Cucurbitaceae, including gourds, melons, *Momordica* sp., squash



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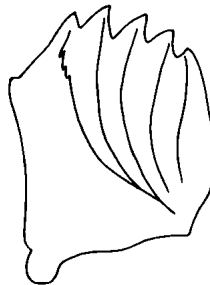
- Head without pigmented spot at genal angle; mandible with a projection on lateral margin (Fig. 106); pinacula concolorous with body in all instars.....
*Diaphania indica* Saunders complex

Distribution: Western Hemisphere

Hosts: 1998: *Cucurbita* sp., *Fernaldia* sp., *Momordica charantia*, *Momordica balsima*, *Murraya* sp., *Ocimum basilicum*, *Sechium edule*, *Thymus vulgaris*

pre-1998: Cucurbitaceae, including cucumbers, cantaloupe, gourds, melons, pumpkins, squash

Note: to separate pupae of *D. hyalinata* (L.) from *D. indica* (Saunders): proboscis extends to A7 in *indica* and to A8 or A9 in *hyalinata*; *hyalinata* occurs from Canada south to Argentina, *indica* is cosmopolitan, in the Western Hemisphere occurring from Florida to South America; see Whittle & Ferguson 1987a; Clavijo 1990.



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50. Head, prothoracic shield, and body pinacula brownish yellow, not concolorous.....
*Leucinodes orbonalis* (Guenée)
- Distribution: Africa and Southeast Asia, does not occur in Hawaii
- Hosts:1998: *Capsicum sp.*, *Punica granatum*, *Solanum sp.*, *Solanum melongena*
- pre-1998: chayote, potatoes, Solanaceae, tomatoes
- Note: The character that separates *L. orbonalis* from *N. elegantalis*, the presence of a dark spot on the anterior margin of the pinaculum of seta D1 of A2 to A8, was found to occur in both species; no adults of this species have been observed from the Western Hemisphere; see Whittle & Ferguson 1987b
-
- Head and prothoracic shield pale yellow, pinacula concolorous with body
*Neoleucinodes elegantalis* (Guenée)
- Distribution: Mexico to South America, and West Indies
- Hosts:1998: *Capsicum sp.*, *Capsicum annuum*, *Lycopersicon sp.*, *Lycopersicon esculentum*,
Sechium edule, *Solanum sp.*, *Solanum melongena*, *Solanum quitoense*,
Solanum torvum
- pre-1998: Solanaceae

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Table 2: Hosts and pyraloid larvae.

Hosts	Pyraloid species
<i>Abelmoschus esculentus</i> (see okra)	
<i>Acacia</i>	<i>Corcyra cephalonica</i>
<i>Acanthocereus</i>	<i>Ephestia elutella</i>
Alfalfa [<i>Medicago sativa</i>]	<i>Achyra rantalis</i>
	<i>Elasmopalpus lignosellus</i>
	<i>Ephestia elutella</i>
	<i>Herpetogramma bipunctalis</i>
	<i>Udea rubigalis</i>
<i>Allium</i>	<i>Ephestia elutella</i>
	<i>Pyralis farinalis</i>
<i>Allium cepa</i> (onion)	
<i>Allium sativum</i> (see garlic)	
allspice	<i>Udea rubigalis</i>
Amaranthaceae (see <i>Amaranthus</i> , <i>Celosia</i>)	
<i>Amaranthus</i>	<i>Cryptoblabes</i>
	<i>Herpetogramma bipunctalis</i>
	<i>Pyrausta</i>
	<i>Rhectocraspeda periusalis</i>
	<i>Spoladea recurvalis</i>
	<i>Udea rubigalis</i>
<i>Amaranthus caudatus</i> (see Inca wheat)	
<i>Anacardium</i>	<i>Cadra cautella</i>
<i>Ananas comosus</i> (see pineapple)	
<i>Annona</i>	<i>Amyelois transitella</i>
	<i>Ectomyelois ceratoniae</i>
	<i>Ephestia kuehniella</i>
<i>Apium graveolens</i> (see celery)	
apple [<i>Malus</i>]	<i>Amyelois transitella</i>
	<i>Ostrinia nubilalis</i>
Arabian jasmine [<i>Jasminium sambac</i>]	<i>Hendecasis duplifascialis</i>
<i>Arachis</i>	<i>Corcyra cephalonica</i>
<i>Arachis hypogaea</i> (see peanuts)	
<i>Areca catechu</i> (see areca nut, betel nut)	
areca nut, betel nut [<i>Areca catechu</i>]	<i>Paralipsa gularis</i>
Areca palm [<i>Chrysalidocarpus</i>]	<i>Cadra cautella</i>
	<i>Spoladea recurvalis</i>
<i>Armoracia rusticana</i> (see horseradish)	
ash gourd [<i>Benincasa hispida</i>]	<i>Phidotricha erigens</i>
<i>Asparagus officinalis</i> (see asparagus)	
asparagus [<i>Asparagus officinalis</i>]	<i>Elasmopalpus lignosellus</i>
Asteraceae	<i>Homoeosoma electellum</i>

Hosts	Pyraloid species
avocado [<i>Persea americana</i>] <i>Bambusa</i>	<i>Spoladea recurvalis</i> <i>Aglossa caprealis</i> <i>Cadra cautella</i> <i>Paralipsa gularis</i>
bastard cedar [<i>Guazuma ulmifolia</i>]	<i>Corcyra cephalonica</i> <i>Paralipsa gularis</i>
basil [<i>Ocimum basilicum</i>]	<i>Diaphania indica</i> complex <i>Pyrausta</i> <i>Udea rubigalis</i>
beans (many genera & species)	<i>Elasmopalpus lignosellus</i> <i>Fundella pellucens</i> <i>Maruca vitrata</i> <i>Ostrinia nubilalis</i> <i>Udea rubigalis</i>
beans, dried	<i>Cadra figulilella</i>
beets [<i>Beta vulgaris</i>]	<i>Achyra rantalis</i> <i>Herpetogramma bipunctalis</i> <i>Ostrinia nubilalis</i> <i>Spoladea recurvalis</i> <i>Udea rubigalis</i>
bell pepper [<i>Capsicum annuum</i>]	<i>Etiella zinckenella</i> <i>Neoleucinodes elegantalis</i> <i>Paralipsa gularis</i> <i>Plodia interpunctella</i>
<i>Benincasa hispida</i> (see ash gourd)	
<i>Berberis</i>	<i>Cadra cautella</i> <i>Plodia interpunctella</i>
<i>Beta vulgaris</i> (see beets, white chard)	
<i>Bidens</i>	<i>Homoeosoma electellum</i>
black walnut [<i>Juglans nigra</i>]	<i>Ectomyelois ceratoniae</i> <i>Ephestia elutella</i>
<i>Brassica</i> (see mustard)	
<i>Brassica napus</i> , <i>B. rapa</i> (see turnip)	
<i>Brassica oleracea</i> (see brussel sprouts, cabbage, cauliflower)	
<i>Brassica pekinensis</i> (see Chinese cabbage)	
Brassicaceae (see cabbage, turnips, brussel sprouts, cauliflower, mustard)	
broad bean [<i>Vicia faba</i>]	<i>Plodia interpunctella</i>
brussel sprouts [<i>Brassica oleracea</i>]	<i>Evergestis rimosalis</i> <i>Hellula phidilealis</i> <i>Hellula rogatalis</i>
butter beans [<i>Phaseolus lunatus</i>]	<i>Etiella zinckenella</i> <i>Maruca vitra</i>

Hosts

Pyraloid species

cabbage [<i>Brassica oleracea</i>]	<i>Mussidia nigrivenella</i> <i>Chilo suppressalis</i> <i>Evergestis rimosalis</i> <i>Hellula phidilealis</i> <i>Hellula rogatalis</i> <i>Udea rubigalis</i>
<i>Cabomba</i> (see fanwort)	
cacao [<i>Theobroma cacao</i>]	<i>Cadra cautella</i> <i>Mussidia nigrivenella</i>
cactus [<i>Opuntia</i>]	<i>Etiella zinckenella</i> <i>Loxomorpha flavidissimalis</i>
<i>Caesalpinia pulcherrima</i> (see dwarf poinciana)	
<i>Cajanus cajan</i> (see pigeon peas)	
calabar beans [<i>Physostigma venenosum</i>]	<i>Mussidia nigrivenella</i>
<i>Calophyllum brasiliense</i> (see Santa Maria, galba)	
<i>Camellia sinensis</i> (see tea)	
cantaloupe [<i>Cucumis melo</i>]	<i>Diaphania indica</i> complex <i>Diaphania nitidalis</i> <i>Cadra cautella</i> <i>Cadra figulilella</i> <i>Ectomyelois ceratoniae</i> <i>Ephestia elutella</i> <i>Leucinodes orbonalis</i> <i>Lineodes integra</i> <i>Neoleucinodes elegantalis</i> <i>Ostrinia nubilalis</i> <i>Plodia interpunctella</i>
<i>Capsicum</i>	
<i>Capsicum annuum</i> (see bell pepper)	
<i>Carapa guianensis</i> (see crabwood)	
<i>Carica papaya</i> (see papaya)	
carob [<i>Ceratonia siliqua</i>]	<i>Cadra calidella</i> <i>Ectomyelois ceratoniae</i> <i>Mussidia nigrivenella</i> <i>Paralipsa gularis</i>
<i>Cassia</i> (see cassia)	
<i>Cassia fistula</i> (see golden-shower tree)	
<i>Cassia grandis</i>	<i>Trachylepidia fructicassiella</i>
cassia [<i>Cassia</i>]	<i>Corcyra cephalonica</i>

Hosts

Pyralid species

<i>Castanea</i> (see chestnut)	<i>Trachylepidia fructicassiella</i>
<i>Castanea sativa</i> (see European chestnut)	
<i>Catalpa</i>	<i>Conogethes</i>
cat-claw mimosa [<i>Mimosa pigra</i>]	<i>Elasmopalpus lignosellus</i>
	<i>Phidotricha erigens</i>
cat-tail [<i>Typha latifolia</i>]	Schoenobiinae
cauliflower [<i>Brassica oleracea</i>]	<i>Evergestis rimosalis</i>
	<i>Hellula phidilealis</i>
	<i>Hellula rogatalis</i>
<i>Cedrela</i> (see Spanish cedar)	
celery [<i>Apium graveolens</i>]	<i>Ostrinia nubilalis</i>
	<i>Udea rubigalis</i>
<i>Celosia</i>	<i>Spoladea recurvalis</i>
<i>Ceratonia siliqua</i> (see carob)	
cereal products	<i>Ephestia elutella</i>
<i>Cereus</i>	<i>Ectomyelois ceratoniae</i>
	<i>Diaphania nitidalis</i>
	<i>Leucinodes orbonalis</i>
	<i>Neoleucinodes elegantalis</i>
<i>Chaenomeles japonica</i>	<i>Cryptoblabes</i>
chayote [<i>Sechium edule</i>]	<i>Diaphania indica</i> complex
Chenopodiaceae (see spinach, beets, swiss chard)	
cherry tomato [<i>Physalis peruviana</i>]	<i>Lineodes integra</i>
chestnut [<i>Castanea</i>]	<i>Cadra calidella</i>
	<i>Conogethes</i>
	<i>Ephestia elutella</i>
	<i>Paralipsa gularis</i>
chickpeas [<i>Cicer arietinum</i>]	<i>Ancylostomia stercorea</i>
	<i>Etiella zinckenella</i>
	<i>Plodia interpunctella</i>
Chimonanthus	<i>Ectomyelois ceratoniae</i>
Chinese cabbage [<i>Brassica pekinensis</i>]	<i>Hellula phidilealis</i>
Chinese pear [<i>Pyrus pyriflora</i>]	<i>Ectomyelois ceratoniae</i>
<i>Chrysalidocarpus</i> (see areca palm)	
<i>Chrysanthemum</i>	<i>Spoladea recurvalis</i>
	<i>Udea rubigalis</i>
<i>Chrysophyllum</i>	<i>Ephestia kuenhiella</i>
<i>Cicer arietinum</i> (see chickpeas)	
<i>Citrullus lanatus</i> (see watermelon)	
Citrus	<i>Cadra cautella</i>
<i>Citrus sinensis</i> (see oranges)	

Hosts

Pyraloid species

<i>Cleome</i> (see spider-plant)	
clover [<i>Trifolium</i>]	<i>Ostrinia nubilalis</i> <i>Udea rubigalis</i>
cocoa beans [<i>Theobroma cacao</i>]	<i>Corcyra cephalonica</i>
<i>Coffea arabica</i> (see coffee)	
coffee [<i>Coffea arabica</i>]	<i>Cadra cautella</i> <i>Corcyra cephalonica</i> <i>Elasmopalpus lignosellus</i> <i>Corcyra cephalonica</i>
<i>Cola</i>	
<i>Coleus</i> (see <i>Plectranthus</i>)	
<i>Colocasia</i>	<i>Spoladea recurvalis</i>
Compositae	see Asteraceae
<i>Corchorus olitorius</i> (see tossa jute)	
corn [<i>Zea mays</i>]	<i>Amyelois transitella</i> <i>Cadra cautella</i> <i>Chilo suppressalis</i> <i>Diatraea</i> <i>Ectomyelois ceratoniae</i> <i>Elasmopalpus lignosellus</i> <i>Etiella zinckenella</i> <i>Eoreuma loftini</i> <i>Hypsipyla</i> <i>Moodna bisinuella</i> <i>Ostrinia nubilalis</i> <i>Paralipsa gularis</i> <i>Phidotricha erigens</i> <i>Spoladea recurvalis</i>
<i>Corylus avellana</i> (see European filbert, European hazelnut)	
cotton [<i>Gossypium</i>]	<i>Achrya rantalis</i> <i>Herpetogramma bipunctalis</i> <i>Homoeosoma electellum</i> <i>Phidotricha erigens</i> <i>Ancylostomia stercorea</i> <i>Elasmopalpus lignosellus</i> <i>Fundella pellucens</i> <i>Maruca vitrata</i> <i>Trachylepidia fructicassiella</i> <i>Amyelois transitella</i> <i>Ectomyelois ceratoniae</i> <i>Hypsipyla</i>
cow peas [<i>Vigna unguiculata</i>]	
crabapple [<i>Malus sylvestris</i>]	
crabwood [<i>Carapa guianensis</i>]	
Cruciferae (see Brassicaceae)	
cucumbers [<i>Cucumis sativa</i>]	<i>Diaphania indica complex</i> <i>Diaphania nitidalis</i>

Hosts

Pyralid species

Udea rubigalis

Cucumis

Cucumis melo (see cantaloupes)

Cucumis sativus (see cucumber)

Cucurbita (see gourds, squash)

Diaphania nitidalis

Cadra cautella

Diaphania indica complex

Diaphania nitidalis

Ectomyelois ceratoniae

Etiella zinckenella

Paralipsa gularis

Cucurbita pepo (see pumpkin)

Cucurbitaceae (see squash, cantaloupes, cucumbers, gourds, pumpkins)

cumin [*Cuminum*]

Cuminum (see cumin)

Cydonia oblonga (see quince)

Cymbopogon citratus (see lemon grass)

Cyperus papyrus (see papyrus)

dates [*Phoenix*]

Corcyra cephalonica

Cadra calidella

Cryptoblabes

Ectomyelois ceratoniae

Cadra cautella

Cadra figulilella

Ectomyelois ceratoniae

Paralipsa gularis

Ephestia kuehniella

date palm [*Phoenix dactylifera*]

Dennetia

Dianthus (see pink)

Dimocarpus longan (see longan)

dried foodstuffs

dried fruits

dried seeds

dried vegetable products

Cadra calidella

Cadra calidella

Cadra figulilella

Cadra figulilella

Cadra cautella

Ephestia elutella

Ephestia kuehniella

Pyralis farinalis

Trachylepidia fructicassiella

Paralipsa gularis

Amyelois transitella

Chilo suppressalis

Leucinodes orbonalis

Lineodes integra

Neoleucinodes elegantalis

Ostrinia nubilalis

Rhectocraspeda periusalis

dunnage

dwarf poinciana [*Caesalpinia pulcherrima*]

eggplant [*Solanum melongena*]

Hosts

Pyraloid species

<i>Elasis</i>	<i>Paralipsa gularis</i>
<i>Eriobotrya japonica</i> (see loquat)	
<i>Eryngium foetidum</i>	<i>Spoladea recurvalis</i>
<i>Eupatorium</i>	<i>Spoladea recurvalis</i>
European chestnut [<i>Castanea sativa</i>]	<i>Cadra figulilella</i>
	<i>Ectomyelois ceratoniae</i>
	<i>Etiella zinckenella</i>
	<i>Plodia interpunctella</i>
European filbert, European hazelnut [<i>Corylus avellana</i>]	<i>Elasmopalpus lignosellus</i>
Fabaceae (see legumes)	
Fanwort (<i>Cabomba</i>)	<i>Parapoynx</i>
<i>Fernaldia</i>	<i>Diaphania indica</i> complex
<i>Ficus</i>	<i>Cadra calidella</i>
	<i>Cadra figulilella</i>
<i>Ficus carica</i> (see fig)	
Fig [<i>Ficus carica</i>]	<i>Cadra calidella</i>
	<i>Cadra figulilella</i>
	<i>Ectomyelois ceratoniae</i>
	<i>Plodia interpunctella</i>
foodstuffs	<i>Pyralis farinalis</i>
<i>Fragaria</i> (see strawberries)	
<i>Gardenia</i>	<i>Conogethes</i>
	<i>Hendecasis duplifascialis</i>
garlic [<i>Allium sativum</i>]	<i>Aglossa caprealis</i>
	<i>Cadra cautella</i>
	<i>Cadra figulilella</i>
	<i>Plodia interpunctella</i>
<i>Gleditsia</i>	
<i>Glycine max</i> (see soybeans)	
golden shower tree [<i>Cassia fistula</i>]	<i>Trachylepidia fructicassiala</i>
<i>Gomphrena</i>	<i>Herpetogramma bipunctalis</i>
<i>Gossypium</i> (see cotton)	
<i>Gossypium hirsutum</i> (see upland cotton)	
gourds [<i>Cucurbita</i>]	<i>Diaphania indica</i> complex
	<i>Diaphania nitidalis</i>
grain (damp)/fungus	<i>Aglossa caprealis</i>
grapes [<i>Vitis</i>]	<i>Cryptoblabes</i>
	<i>Ephestia elutella</i>
	<i>Plodia interpunctella</i>
guajava or guava [<i>Psidium guajava</i>]	<i>Cadra cautella</i>
	<i>Cadra figulilella</i>
	<i>Conogethes</i>

Hosts

~~Cyrtobius species~~
~~Ectomyelois ceratoniae~~

Guazuma ulmifolia (see bastard cedar)

guizotia [*Guizotia abyssinica*]

Guizotia abyssinica (see guizotia)

Helianthus annuus (see sunflower)

Hibiscus (see mallow)

horseradish [*Armoracia rusticana*]

horse-radish tree [*Moringa oleifera*]

Hydrilla

Hygrophila

Impatiens

Inca wheat [*Amaranthus caudatus*]

Inga

Ipomoea

Ipomoea batatas (see sweet potato)

jasmine [*Jasminium*]

Jasminium (see jasmine)

Jasminium sambac (see Arabian jasmine)

Jatropha

Jatropha curcas (see physic nut)

Johnson grass [*Sorghum halapense*]

Juglans (see walnuts)

Juglans nigra (see black walnut)

jujube [*Ziziphus jujuba*]

lablab bean [*Lablab pupureus*]

Lablab pupureus (see lablab bean)

Lactuca (see lettuce)

langsat [*Lansium domesticum*]

Lansium domesticum (see langsat)

legumes

Leguminosae

lemon grass [*Cymbopogon citratus*]

Lens

lettuce [*Lactuca*]

lima beans [*Phaseolus lunatus*]

Cadra cautella

Trachylepidia fructicassiella

Ephestia kuehniella

Parapoynx

Parapoynx

Spoladea recurvalis

Herpetogramma bipunctalis

Corcyra cephalonica

Trachylepidia fructicassiella

Udea rubigalis

Hendecasis duplifascialis

Herpetogramma bipunctalis

Elasmopalpus lignosellus

Plodia interpunctella

Etiella zinckenella

Ectomyelois ceratoniae

Paralipsa gularis

Ectomyelois ceratoniae

Etiella zinckenella

Maruca vitrata

see Fabaceae

Chilo suppressalis

Eoreuma loftini

Corcyra cephalonica

Ostrinia nubilalis

Udea rubigalis

Etiella zinckenella

Fundella pellucens

Maruca vitrata

Phidotricha erigens

Limnophila Hosts

Pyraloid species

locust bean (see carob)

longan [*Dimocarpus longan*]

Conogethes

Cryptoblabes

loosestrife [*Lythrum*]

Cryptoblabes

Conogethes

loquat [*Eriobotrya japonica*]

Phidotricha erigens

Lycopersicon

Neoleucinodes elegantalis

Lycopersicon esculentum (= *L. lycopersicon*) (see tomatoes)

Lythrum (see loosestrife)

mahogany [*Swietenia*]

Hypsipyla

mallow [*Hibiscus*]

Conogethes

Malus (see apple)

Malus sylvestris (see crabapple)

Mammea

Phidotricha erigens

Mangifera indica (see mango)

mango [*Mangifera indica*]

Amyelois transitella

Ectomyelois ceratoniae

Phidotricha erigens

Manihot esculenta (see manioc)

Manila tamarind [*Pithecellobium dulce*]

Cadra cautella

Ectomyelois ceratoniae

manioc [*Manihot esculenta*]

Cadra figulilella

Maranta

Elasmopalpus lignosellus

Medicago arabica (see clover)

Medicago sativa (see alfalfa)

melons [*Cucumis melo*]

Diaphania indica complex

Diaphania nitidalis

Elasmopalpus lignosellus

Mentha

Pyrausta

Spoladea recurvalis

Udea rubigalis

millet [*Panicum miliaceum*]

Chilo suppressalis

Eoreuma loftini

Mimosa pigra (see cat-claw mimosa)

Momordica

Diaphania nitidalis

Momordica balsamina

Diaphania indica complex

Momordica charantia

Diaphania indica complex

Diaphania nitidalis

Pyrausta

Rhectocraspeda periusalis

Moringa oleifera (see horse-radish tree)

Hosts

Pyaloid species

<i>Morus</i>	<i>Cadra calidella</i>
	<i>Cadra cautella</i>
	<i>Cadra figulilella</i>
	<i>Plodia interpunctella</i>
<i>Murraya</i>	<i>Diaphania indica</i> complex
<i>Musa</i>	<i>Cryptoblabes</i>
	<i>Diatraea</i>
mustard [<i>Brassica</i>]	<i>Corcyra cephalonica</i>
	<i>Ephestia elutella</i>
	<i>Evergestis rimosalis</i>
	<i>Hellula phidilealis</i>
	<i>Hellula rogatalis</i>
	<i>Paralipsa gularis</i>
	<i>Parapoinx</i>
	<i>Neoleucinodes elegantalis</i>
<i>Myriophyllum</i>	
naranjilla [<i>Solanum quitoense</i>]	
<i>Narcissus tazetta</i> (see polyanthus narcissus)	
<i>Nephelium lappaceum</i> (see rambutan)	
nosegay [<i>Plumeria rubra</i>]	<i>Hendecasis duplifascialis</i>
nuts (stored)	<i>Cadra calidella</i>
	<i>Cadra figulilella</i>
	<i>Ectomyelois ceratoniae</i>
<i>Ocimum</i>	<i>Udea rubigalis</i>
	<i>Pyrausta</i>
<i>Ocimum basilicum</i> (see basil)	
okra [<i>Abelmoschus esculentus</i>]	<i>Corcyra cephalonica</i>
<i>Oncidium</i>	<i>Paralipsa gularis</i>
onion [<i>Allium cepa</i>]	<i>Pyrausta</i>
<i>Opuntia</i> (see cactus)	
oranges [<i>Citrus sinensis</i>]	<i>Ameylois transitella</i>
	<i>Cryptoblabes</i>
	<i>Homoeosoma electellum</i>
Orchidaceae	<i>Hendecasis duplifascialis</i>
<i>Origanum</i>	<i>Pyrausta</i>
<i>Oryza</i>	<i>Corcyra cephalonica</i>
	<i>Plodia interpunctella</i>
<i>Oryza sativa</i> (see rice)	
packing	<i>Aglossa caprealis</i>
	<i>Pyralis farinalis</i>
<i>Paeonia</i> (see peony)	
<i>Panicum miliaceum</i> (see millet)	
papaya [<i>Carica papaya</i>]	<i>Cadra cautella</i>
papyrus [<i>Cyperus papyrus</i>]	<i>Paralipsa gularis</i>

Parkia Hosts

peach [*Prunus persica*]

peanuts [*Arachis hypogaea*]

pear [*Pyrus communis*]

peas [*Pisum sativum*]

peony [*Paeonia*]

Persea americana (see avocado)

Petiveria alliacea

Phaseolus

Phaseolus lunatus (see butter beans, lima beans)

Phaseolus vulgaris (see string beans)

Phoenix (see dates)

Phoenix dactylifera (see date palm)

Physalis ixocarpa (see tomatillo)

Physalis peruviana (see cherry tomato)

physic nut [*Jatropha curcas*]

Physostigma venenosum (see calabar beans)

Phytolacca americana (see pokeweed)

pigeon peas [*Cajanus cajan*]

Pimenta dioica (see allspice, pimento)

pimento

pine [*Pinus*]

pineapple [*Ananas comosus*]

Epilachnids species

Amyelois transitella

Conogethes

Plodia interpunctella

Cadra cautella

Amyelois transitella

Cadra cautella

Conogethes

Ectomyelois ceratoniae

Ancylostomia stercorea

Cadra cautella

Elasmopalpus lignosellus

Etiella zinckenella

Fundella pellucens

Maruca vitrata

Ostrinia nubilalis

Udea rubigalis

Amyelois transitella

Phidotracha erigens

Cadra cautella

Ectomyelois ceratoniae

Plodia interpunctella

Spoladea recurvalis

Ancylostomia stercorea

Amyelois transitella

Etiella zinckenella

Fundella pellucens

Maruca vitrata

Udea rubigalis

Conogethes

Alpheias conspirata

Cadra cautella

Cryptoblabes

Elasmopalpus lignosellus

Genopaschia protomis

Hosts	Pupal hosts species
pink [<i>Dianthus</i>]	<i>Hendecasis duplifascialis</i>
<i>Pinus</i> (see pine)	
<i>Pista stratiotes</i> (see water-lettuce)	
<i>Pistacia</i>	<i>Plodia interpunctella</i>
<i>Pisum sativum</i> (see peas)	
<i>Pithecellobium dulce</i> (manila tamarind)	
<i>Plectranthus</i>	<i>Cadra calidella</i>
<i>Plumeria rubra</i> (see nosegay)	
Poaceae	<i>Plodia interpunctella</i>
pokeweed [<i>Phytolacca americana</i>]	<i>Spoladea recurvalis</i>
<i>Polianthus tuberosa</i> (see tuberose)	
polyanthus narcissus [<i>Narcissus tazetta</i>]	<i>Pyralis farinalis</i>
<i>Polygonum perfoliatum</i>	<i>Spoladea recurvalis</i>
pomegranate [<i>Punica granatum</i>]	<i>Amyelois transitella</i>
	<i>Cryptoblabes</i>
	<i>Ectomyelois ceratoniae</i>
	<i>Ephestia elutella</i>
	<i>Leucinodes orbonalis</i>
	<i>Paralipsa gularis</i>
	<i>Plodia interpunctella</i>
potatoes [<i>Solanum tuberosum</i>]	<i>Ephestia elutella</i>
	<i>Leucinodes orbonalis</i>
	<i>Ostrinia nubilalis</i>
	<i>Rhectocraspeda periusalis</i>
	<i>Plodia interpunctella</i>
<i>Prosopis</i>	<i>Ephestia elutella</i>
<i>Protea</i>	<i>Plodia interpunctella</i>
prune plum [<i>Prunus domestica</i>]	<i>Cadra calidella</i>
<i>Prunus</i>	<i>Cadra figulilella</i>
	<i>Ephestia elutella</i>
<i>Prunus avium</i> (see sweet cherry)	
<i>Prunus domestica</i> (see prune plum)	
<i>Prunus persica</i> (see peach)	
<i>Psidium guajava</i> (see guajava or guava)	
pumpkin [<i>Cucurbita pepo</i>]	<i>Diaphania indica</i> complex
	<i>Diaphania nitidalis</i>
<i>Punica granatum</i> (see pomegranate)	
<i>Pyrus communis</i> (see pear)	
<i>Pyrus pyriflora</i> (see Chinese pear)	
quince [<i>Cydonia oblonga</i>]	<i>Amyelois transitella</i>
	<i>Ectomyelois ceratoniae</i>
	<i>Etiella zinckenella</i>
radish [<i>Raphanus sativus</i>]	<i>Hellula phidilealis</i>
	<i>Hellula rogatalis</i>

Hosts	Pyraloid species
raisins [<i>Vitis</i>]	<i>Udea rubigalis</i> <i>Cryptoblabes</i> <i>Ephestia elutella</i> <i>Plodia interpunctella</i>
rambutan [<i>Nephelium lappaceum</i>]	<i>Aglossa caprealis</i> <i>Conogethes</i> <i>Paralipsa gularis</i> <i>Amyelois transitella</i>
<i>Randia</i>	
<i>Raphanus sativus</i> (see radish)	
<i>Rheum rhabarbarum</i> (see rhubarb)	
<i>Rhododendron</i>	<i>Paralipsa gularis</i>
rhubarb [<i>Rheum rhabarbarum</i>]	<i>Ostrinia nubilalis</i>
rice [<i>Oryza sativa</i>]	<i>Cadra cautella</i> <i>Chilo suppressalis</i> <i>Corcyra cephalonica</i> <i>Diatraea</i> <i>Eoreuma loftini</i> <i>Ephestia elutella</i> <i>Paralipsa gularis</i> see rice
rice straw	
<i>Rorippa</i> (see watercress)	
<i>Rosa</i> (see roses)	
rose, Malay apple [<i>Syzygium malaccense</i>]	<i>Conogethes</i>
roses [<i>Rosa</i>]	<i>Achyra rantalis</i> <i>Cadra cautella</i> <i>Udea rubigalis</i> <i>Cadra cautella</i> <i>Ancylostomia stercorea</i>
<i>Rubus</i>	
<i>Rumex</i>	
<i>Saccharum officinarum</i> (see sugarcane)	
Santa Maria, galba [<i>Calophyllum brasiliense</i>]	<i>Paralipsa gularis</i>
<i>Sechium edule</i> (see chayote)	
sesame [<i>Sesamum indicum</i>]	<i>Cadra cautella</i> <i>Corcyra cephalonica</i>
<i>Sesamum indicum</i> (see sesame)	
<i>Sesbania</i>	<i>Ectomyelois ceratoniae</i>
<i>Sesuvium</i>	<i>Achyra rantalis</i>
<i>Sida</i>	<i>Elasmopalpus lignosellus</i>
Solanaceae (see eggplant, potatoes, tomatoes)	
<i>Solanum</i>	<i>Leucinodes orbonalis</i> <i>Neoleucinodes elegantalis</i> <i>Paralipsa gularis</i>
<i>Solanum melongena</i> (see eggplant)	
<i>Solanum quitoense</i> (see naranjilla)	

Hosts

Pyraloid species

Solanum torvum (see turkey berry)

Solanum tuberosum (see potatoes)

Sorghum (see sorghum)

sorghum [*Sorghum*]

Sorghum bicolor (see sorghum)

Sorghum halapense (see Johnson grass)

soybeans [*Glycine max*]

Spanish cedar [*Cedrela*]

spinach

Spinacia

Spinacia oleracea (see spinach)

squash [*Cucurbita*]

Stirlingia

stored fruit products

stored grain (including cereals)

stored vegetable products

(including seeds)

strawberries [*Fragaria*]

string beans [*Phaseolus vulgaris*]

Chilo suppressalis

Corcyra cephalonica

Diatraea

Elasmopalpus lignosellus

Eoreuma loftini

Phidotricha erigens

Achyra rantalis

Elasmopalpus lignosellus

Herpetogramma bipunctalis

Spoladea recurvalis

Hypsipyla

Hellula phidilealis

Spoladea recurvalis

Udea rubigalis

Herpetogramma bipunctalis

Spoladea recurvalis

Diaphania indica complex

Diaphania nitidalis

Paralipsa gularis

Plodia interpunctella

Ephestia kuehniella

Mussidia nigrivenella

Pyralis farinalis

Plodia interpunctella

Cadra cautella

Corcyra cephalonica

Ephestia elutella

Ephestia kuehniella

Etiella zinckenella

Mussidia nigrivenella

Paralipsa gularis

Plodia interpunctella

Elasmopalpus lignosellus

Ostrinia nubilalis

Ancylostomia stercorea

Corcyra cephalonica

Elasmopalpus lignosellus

Hosts

Pyralid species

Strobilanthes

sugar beets (see beets)

sugarcane [*Saccharum officinarum*]

sunflower [*Helianthus annuus*]

sweet cherry [*Prunus avium*]

sweet potato [*Ipomoea batatas*]

Swietenia (see mahogany)

swiss chard

Syzygium malaccense (see rose or Malay apple)

tamarind [*Tamarindus indica*]

Tamarindus indica (see tamarind)

tamarisk [*Tamarix*]

Tamarix (see tamarisk)

tea [*Camellia sinensis*]

Theobroma cacao (see cacao)

thyme

Thymus

Thymus vulgaris (see thyme)

tomatillo [*Physalis ixocarpa*]

tomatoes [*Lycopersicon esculentum* (= *L. lycopersicon*)]

Maruca vitrata

Ostrinia nubilalis

Herpetogramma bipunctalis

Rhectocraspeda periusalis

Cadra figulilella

Chilo suppressalis

Diatraea

Elasmopalpus lignosellus

Eoreuma loftini

Homoeosoma electellum

Cadra cautella

Cadra figulilella

Ectomyelois ceratoniae

Plodia interpunctella

Megastes

Udea rubigalis

Spoladea recurvalis

Amyelois transitella

Cadra cautella

Ectomyelois ceratoniae

Phidotricha erigens

Cryptoblabes

Plodia interpunctella

Diaphania indica complex

Pyrausta

Pyrausta

Lineodes integra

Chilo suppressalis

Leucinodes orbonalis

Lineodes integra

Neoleucinodes elegantalis

Ostrinia nubilalis

Rhectocraspeda periusalis

tossa jute [*Crotalaria olitorius*]

Heliothis virescens
Pyrausta nictalis

Trifolium (see clover)

Triticum (see wheat)

Tropaeolum majus (see nasturtium)

tuberose [*Polyanthus tuberosa*]

turkey berry [*Solanum torvum*]

turnip [*Brassica napus*, *B. rapa*]

Typha latifolia (see cat-tail)

upland cotton [*Gossypium hirsutum*]

Vaccinium

Vallisneria

vegetable (rotting)/fungus

Vicia faba (see broad bean)

Vigna

Vigna unguiculata (see cow peas)

Vitis (see grapes, raisins)

Vitis vinifera (see wine grape)

walnuts [*Juglans*]

watercress [*Rorippa*]

water-lettuce [*Pista stratiotes*]

watermelon [*Citrullus lanatus*]

wheat [*Triticum*]

white chard [*Beta vulgaris*]

wine grape [*Vitis vinifera*]

Xanthosoma braziliense

Zea mays (see corn)

Zingiber

Ziziphus jujuba (see jujube)

Hendecasis duplifascialis

Lineodes integra

Neoleucinodes elegantalis

Hellula phidilealis

Hellula rogatalis

Paralipsa gularis

Cadra cautella

Parapoynx

Aglossa caprealis

Maruca vitrata

Trachylepidia fructicassiella

Amyelois transitella

Evergestis rimosalis

Schoenobiinae

Pyrausta

Chilo suppressalis

Corcyra cephalonica

Ostrinia nubilalis

Hellula phidilealis

Cadra calidella

Paralipsa gularis

Herpetogramma bipunctalis

Spoladea recurvalis

Phidotricha erigens