

LepIntercept

An identification resource for intercepted Lepidoptera larvae



Keys About Fact Sheets Glossary Larval Morphology References

<< Previous fact sheet Next fact sheet >>

CRAMBIDAE - *Leucinodes orbonalis* Guenée

Taxonomy

Pyraloidea: Crambidae: Spilomelinae: *Leucinodes orbonalis* Guenée

Common names: brinjal borer, eggplant borer, fruit and shoot borer

Larval diagnosis (Summary)

- SV group unisetose on A1
- Pigmented body pinacula
- Dark spot on D1 pinaculum of A2-8
- S1 posterior of a line connecting stemmata 2 and 3
- Mesothorax and metathorax with the MD and MSD1-2 setae on pigmented pinacula
- From the Old World on *Solanum*

Host/origin information

Most records of *L. orbonalis* in PestID are from Africa. These interceptions represent species in the *L. orbonalis* complex in Africa which are not conspecific to the Asian populations of *L. orbonalis*. Interceptions of true *L. orbonalis* should originate from South Asia on *Solanum*.

Origin	Host(s)
South Asia	<i>Solanum</i>

Recorded distribution

Leucinodes orbonalis is widely distributed throughout China, Nepal, India, Japan, Pakistan, Sri Lanka, and much of Southeast Asia including Indonesia and the Philippines (Hayden et al. 2013).

Identification authority (Summary)

Larvae of *L. orbonalis* are recognized by having a combination of the morphological characters listed above. The origin must be Old World (South Asia) and the host must be *Solanum*. Other similar species from Africa should be identified as "*L. orbonalis* complex."

Pest characterization

(Based on Cavey 2001, Hayden et al. 2013)

- Taxonomy: **High**. Species identification is often possible.
- Distribution: **High**. *Leucinodes orbonalis* is not present in the U.S.
- Potential Impact: **High**. *Leucinodes orbonalis* is a pest.

This ranking characterizes *L. orbonalis* as quarantine significant for the U.S.

Larval diagnosis (Detailed)

No complete description of *L. orbonalis* was found but several authors have partially described the larva. Mathur (1954) noted the SV group on A1 is unisetose, the mandible has no inner teeth, and the spinneret is short. Capps (1963) also mentioned a unisetose SV group and separated *Neoleucinoides elegantalis* from *L. orbonalis* by the pigmentation of the pinacula and position of the S1 seta. Weisman (1974) agreed that the pinacula pigmentation and setal position of S1 varied between the two species. He added that the crochets of *L. orbonalis* are in a mesopenellipse. Later, Weisman (1986) used the unisetose SV group on A1, crescent shaped prespiracular pinaculum, pigmented body pinacula, and presence of a dark spot on the anterior margin of D1 on A2-8 to identify *L. orbonalis*. Further study showed this spot was unreliable as a character to separate all *Neoleucinoides* from all *L. orbonalis*. One problem is that some African specimens in the *L. orbonalis* complex lack the spot whereas it is present in some specimens of *Neoleucinoides* from Central America and the West Indies (Whittle and Ferguson 1987).

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Fig. 1: Late instar, lateral view



Fig. 2: Late instar, lateral view



Fig. 3: Early instar, lateral view

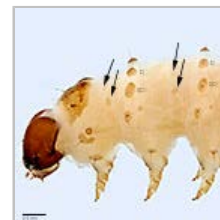


Fig. 4: T2-3



Fig. 5: SV group on A1

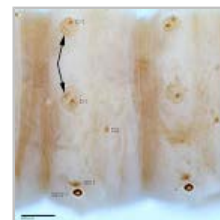


Fig. 6: D1 on A2-8



Fig. 7: L-group on A9



Fig. 8: Crochets



Fig. 9: Head

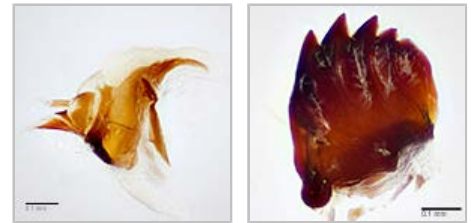


Fig. 10: Hypo. complex Fig. 11: Mandible

As a result of these finds, it was APHIS policy not to record *L. orbonalis* from the New World unless it was based on adult captures, even if larvae keyed to this species in Weisman (1986) (Steward [1987]). Solis (1999) used the presence of the dark spot as a character of both *Neoleucinodes* and *Leucinodes*, later pointing out the spot can fade after preservation (Solis 2011). The SD1 pinacula of A2 and A7 are not reduced (SPIC) and SD1 is anterior to the spiracle on A8 (Hayden et al. 2013). Whittle and Ferguson (1987) suggested further taxonomic work was needed and that *Neoleucinodes* and *Leucinodes* may not be distinct genera.

Figs. 9-11 are from a dissection of a specimen from Nigeria, thus these represent character states in the African "*L. orbonalis* complex." We know of no difference in these structures from *L. orbonalis* in Asia. All other specimens figured are from the Philippines.

Identification authority (Detailed)

Typically, *L. orbonalis* is recognized by having a unisetose SV group on A1, pigmented body pinacula, a dark spot on D1 of A2-8, and S1 posterior of a line connecting stemmata 2 and 3. Other characters include the mesothorax and metathorax with MD and MSD1-2 setae on pigmented pinacula (Solis 2011: couplet 33) and a unisetose L-group on A9. The origin must be Old World and host must be *Solanum*. Records for *Mangifera*, *Beta*, *Ipomoea*, *Pennisetum* (Robinson et al. 2001), *Punica*, chayote, and possibly *Capsicum* (Solis 2011) are suspect associations. *Leucinodes orbonalis* is widely distributed throughout China, Nepal, India, Japan, Pakistan, Sri Lanka, and much of Southeast Asia including Indonesia and the Philippines (Hayden et al. 2013). Adults are not known from any New World locality (Solis 2011).

The unisetose SV group on A1, when present, seems to be very distinctive for recognizing *Neoleucinodes* and *Leucinodes* worldwide. It was used by Passoa (1985) in Honduras for partially identifying *Neoleucinodes*. Other keys for Pyraustinae and Spilomelinae in the United States (Allyson 1981, 1984), Europe (Bollmann 1955), and Asia (Lin 1995) do not even have a couplet for a unisetose condition. Instead, the included genera have a either bisetose or trisetose SV group on A1.

Variation in taxonomic characters of importance is a complicating factor. If the larva has a unisetose SV group on A1, and is from Africa on *Solanum*, but lacks the dark spot on D1, it may be identified as "*L. orbonalis* complex." There are three species in this complex in Africa which are not conspecific to the Asian populations of *L. orbonalis* (Hayden et al. 2013). Mathur (1954) noted variation in the SV setae on A2 for *L. orbonalis* in India and it is likely similar variation will eventually be noticed on A1. If the larva is not unisetose on A1, even if it has a dark spot on D1, and is from *Solanum* in the Old World, it should be left at subfamily Spilomelinae. Specimens with only one side of the larva unisetose, or with only a few D1 pinacula spotted, can be evaluated on a case-by-case basis given the pathway and port experience with this group. Larva that do not have a unisetose SV group on A1, or any spots on the D1 pinacula of A2-8, even if from *Solanum*, should be left at family unless the species-level identification is obvious from other characters.

Do not report *L. orbonalis* from New World interceptions based only on larvae - rear an adult or forward the specimen for molecular analysis. Hayden et al. (2013) [see below] gave characters to separate *L. orbonalis* suspects from other solanaceous feeding pyraloids in the southeastern United States in domestic surveys.

More information

Hayden, J. E., S. Lee, S. C. Passoa, J. Young, J.-F. Landry, V. Nazari, R. Mally, L. A. Somma, and K. M. Ahlmark. 2013. **Digital Identification of Microlepidoptera on Solanaceae**. USDA-APHIS-PPQ Identification Technology Program (ITP). Fort Collins, CO.

Origin records

"*Leucinodes orbonalis*" has been intercepted from the following locations:

Angola, Argentina, Bangladesh, Benin, Bosnia and Herzegovina, Brazil, Burundi, Cameroon, Cape Verde, China, Congo, Costa Rica, Cote D'Ivoire, Ecuador, Egypt, El Salvador, Ethiopia, France (?), Gabon, Gambia, Germany, Ghana, Guatemala, Guinea, Haiti, Honduras, Hong Kong, India, Indonesia, Israel, Jamaica (?), Jordan, Kenya, Laos, Liberia, Malaysia, Mali, Morocco, Myanmar, Nepal, Netherlands, Niger, Nigeria, Philippines, Rwanda, Senegal, Serbia and Montenegro, Sierra Leone, South Africa, South Korea, Sri Lanka, Sweden, Tanzania, Thailand, Togo, Turkey, Uganda, United Kingdom of Great Britain and N. Ireland, Venezuela, Viet Nam, Zambia

Note that confirmed identifications of *L. orbonalis* should originate from South Asia on *Solanum*. Other origins and hosts listed here are questionable or represent other species. There are three species in the *L. orbonalis* complex in Africa that are not conspecific with the Asian species.

Host records

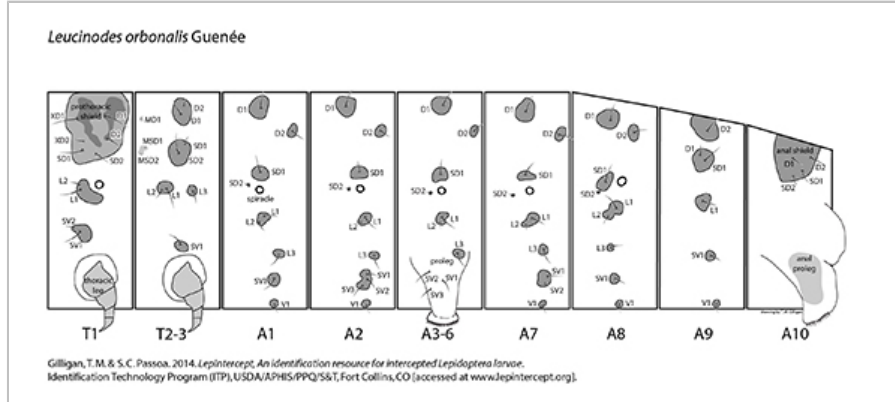
"*Leucinodes orbonalis*" has been intercepted on the following hosts:

Abelmoschus esculentus, *Amaranthus spinosus*, *Astilbe* sp., *Capsicum annuum*, *Capsicum* sp., *Castanea mollissima*, *Cola acuminata*, *Cola nitida*, *Corchorus capsularis*, *Cucurbita maxima*, *Cucurbita* sp., Cucurbitaceae, *Dioscorea* sp., *Erythrina* sp., Fabaceae, *Gnetum africanum*,

Lagenaria siceraria, Lamiaceae, *Limonia acidissima*, *Lycopersicon* sp., *Malus* sp., Malvaceae, *Mangifera* sp., *Myristica fragrans*, *Persea americana*, *Phaseolus* sp., *Phaseolus vulgaris*, *Pithecellobium dulce*, *Psidium guajava*, *Pterocarpus* sp., *Punica* sp., *Pyrus* sp., *Sapodilla* sp., Solanaceae, *Solanum aethiopicum*, *Solanum berejena*, *Solanum betaceum*, *Solanum integrifolium*, *Solanum lycopersicum* var *lycopersicum*, *Solanum macrocarpon*, *Solanum melongena*, *Solanum melongena* var. *esculentum*, *Solanum quitoense*, *Solanum* sp., *Solanum torvum*, *Solanum tuberosum*, *Vernonia amygdalina*, *Zea mays*

Any host not in the Solanaceae requires confirmation.

Setal map



Leucinodes orbonalis setal map



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LepIntercept - An identification resource for intercepted Lepidoptera larvae by Todd M. Gilligan and Steven C. Passoa
Identification Technology Program (ITP), Fort Collins, CO. Last updated February 2014.

