<< Previous fact sheet Next fact sheet >>

CRAMBIDAE - *Diatraea lineolata* (Walker)

Taxonomy

Pyraloidea: Crambidae: Crambinae: *Diatraea lineolata* (Walker)

Common names: Neotropical cornstalk borer

Synonyms: *Chilo culmicolellus*, *Chilo neuricellus*, *Diatraea pallidostricta*

Larval diagnosis (Summary)

- Mandible with small inner tooth (notch)
- Bisetose SV group on the thorax
- Crochets in a triordinal circle
- Paraproct setae are never more than half as long as SV1
- Color is variable; pinacula are pigmented in non-diapausing larvae and pale in diapausing larvae
- Found on corn

Host/origin information

The majority (>97%) of interception records are from Mexico on corn.

Origin	Host(s)
Mexico	*Zea mays*

Recorded distribution

Diatraea lineolata occurs from south Texas to Mexico, Central America, and northern South America. There are also records from parts of the Caribbean (Rodriguez del Bosque et al. 1988).

Identification authority (Summary)

Identification of *D. lineolata* is difficult because of numerous sibling species. In most cases, a genus-level identification is more accurate. A species-level identification is possible if the larva is from certain portions of its known distribution and is associated with corn. See the Detailed Information page for information on other *Diatraea* species.

Pest characterization

(Based on Cavey 2001, Rodriguez del Bosque et al. 1988)

- Taxonomy: **Medium.** Species-level identification is sometimes possible.
- Distribution: **High.** *Diatraea lineolata* is present in the Rio Grande Valley of Texas.
- Potential Impact: **High.** *Diatraea lineolata* is a serious pest.

This ranking characterizes *D. lineolata* as a quarantine significant species in the U.S.

Larval diagnosis (Detailed)

The larva of *D. lineolata*, the Neotropical cornstalk borer, was described in detail by Passoa (1985); this setal map later redrawn by Coto (1997). Color photographs of the late instar larva can be found in King and Saunders (1984), Passoa (1985), Ortega (1987), and Rodriguez del Bosque (2009).

Typically, the two most common corn feeding *Diatraea* (*saccharalis* and *lineolata*) have a small inner tooth (notch) on the mandible (Passoa 1985: fig. 331, Parada et al. 2007); both the L and SV setae anterior to the prothoracic spiracle; a prespiracular group that extends below the prothoracic spiracle but not behind it; a bisetose SV group on the thoracic segments; crochets of A3-6 in a triordinal circle, and in the non-diapausing form, an obvious elongate extra pinacula

Click here to download this Fact Sheet as a printable PDF


Fig. 1: Late instar, lateral view


Fig. 2: Late instar, lateral view


Fig. 3: Late instar, lateral view


Fig. 4: Thorax with bisetose SV group


Fig. 5: Paraproct setae

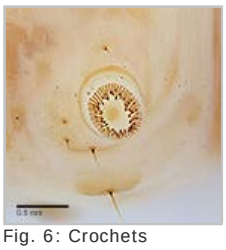


Fig. 6: Crochets


Fig. 7: Head


Fig. 8: Hypo. complex

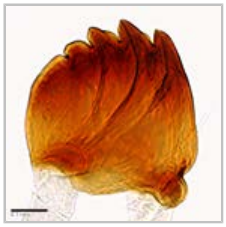


Fig. 9: Mandible

lacking setae on the mesothorax (Passoa 1985).

Deckle (1976) used the paraproct setae to separate *D. grandiosella* from *D. saccharalis* and *D. crambidoides*. Largely because *D. lineolata* and *D. grandiosella* have nearly identical larvae (Passoa 1985, Riley and Solis 2005), Passoa (1985) applied the same character set to separate *D. lineolata* from *D. saccharalis* in Honduras. The paraproct setae are never more than half as long as SV1 in *D. lineolata* whereas in *D. saccharalis* these two setae are approximately equal in length. Riley and Solis (2005) confirmed the utility of the paraproct setae by using them to separate *D. lineolata* and *D. saccharalis* specimens intercepted from Mexico. They did not mention the SV1 seta by name, instead calling it the "next lateral seta". Deckle (1976), Passoa (1985), Riley and Solis (2005) and Parada et al. (2007) all illustrated the paraproct and SV setae of *Diatraea*.

Weisman (1974) noted the bisetose thoracic SV group in *Diatraea* and mentioned the shape of the SD1 pinacula and position of SD2 on A3-6 as useful characters. He did not study *D. lineolata*. On A3-6, the SD1 pinacula extends to the middle of the spiracle and SD2 is below the spiracle in *D. lineolata* (Passoa 1985). This is similar to *D. grandiosella* (Weisman 1974).

Based on Peterson (1962: L44), Passoa (1985) suggested that the substemmatal setae often separate *D. lineolata* and *D. grandiosella*. The SS2 seta usually lies closer to stemma 6 than stemma 5 in *D. grandiosella* (Peterson, 1962). The opposite is often true for *D. lineolata*. Unfortunately, this seta is midway between the two stemmata on many larvae. There are also minor differences in the pattern of spines below the anus (Passoa 1985). The spines of *D. grandiosella* appear slightly thicker and usually cover a wider area than in *D. lineolata*. In both species the spines can be quite faint. Combining these two features with host and orgin can be helpful.

Identification of *D. lineolata* is complicated by larval color variation. Early instars do not resemble the mature larva. In addition, non-diapausing larvae have pigmented pinacula that are pale in diapausing individuals. These are often called summer and winter forms, respectively, in the United States literature (e.g. Peterson 1962, Weisman 1986). Nevertheless, color of living larvae can be an important clue for identification (see Hensley 1960, Peairs and Saunders 1980, Passoa 1985). Early instar *D. lineolata* have the prothoracic shield dark brown whereas in *D. grandiosella* the shield is honey-colored.

Late instars of *Diatraea lineolata* have a light reddish to golden brown head color with black pinacula on a cream to white body color. This is similar to *D. grandiosella* but different from *D. saccharalis*. The head of *D. saccharalis* is a dark red brown, the pinacula are light brown and the body is off white with a light yellow to brown tint. Ortega (1987) and Rodríguez del Bosque (2009) are readily available on line examples of these differences. The comparison of *D. lineolata* to *D. saccharalis* in Rodriguez del Bosque (2009, 2012) shows typical forms, however, the specimen of *D. saccharalis* next to *D. grandiosella* requires confirmation because of the pink longitudinal stripes. Hensley (1960) and Neunzig (1987) said that living larvae of *D. saccharalis* have a pale area around the body pinacula, a useful character if present. Weisman (1986) and Solis (2011) added that *Diatraea* lacks a middorsal pink stripe, indeed no common pest species of *Diatraea* has a middorsal stripe. The diapusing forms of *D. lineolata* and *D. saccharalis* are both pale cream but differ in head color.

Identification authority (Detailed)

There are really only a few situations where identification of *D. lineolata* is justified; otherwise it is more accurate to stop at the genus level. Origin and host information are critical for accurate identification of *Diatraea*. Inspectors must get specific origins from Mexico, photograph the larva or remember details of the head and body color before preservation. Ports must be prepared to send occasional specimens to quarantine facilities for rearing to the adult stage to be sure assumptions on the intercepted fauna have not changed. This is especially important because several species of *Diatraea* have unknown life histories. The literature often cannot be trusted; see comments by Agnew et al. (1988) for Mexico and Passoa (1985) for Central America. Even observations on larvae from experts like Box require caution (Solis pers. comm.).

Corn is the principal host of *D. lineolata*, but records also exist for *Coix lachrymajobi*, teosinte (*Euchlaena mexicana*), sorghum and Johnson grass, rice, *Tripsacum*, wheat, and rarely sugarcane (Peairs and Saunders, 1980, Passoa 1985, Rodriguez del Bosque et al. 1988). Because of numerous sibling species with unknown immatures, it is very difficult to go past genus on *Diatraea* immatures except for those on crop plants. The original native host of *D. lineolata* is unknown, and no doubt there are new foodplants to discover, but for the present it is best to restrict authority for *D. lineolata* to just corn.

There are two issues with regard to origin. *Diatraea lineolata* occurs from south Texas to Mexico, Central America and northern South America (Solis 2004) including parts of the Caribbean (Rodriguez del Bosque et al. 1988). Thus, interceptions from central and southern South America cannot be *D. lineolata* even if on corn.

A bigger problem is that are five species of *Diatraea* recorded from corn in Mexico (Riley and Solis 2005). They are *D. grandiosella* (parts of northern, western and southern Mexico), *D. postlineella* (only from Veracruz), and *D. muellerella* (from Morelos and Guerrero). *Diatraea lineolata* and *D. saccharalis* are generally considered the most widespread members of the genus (e.g. van Huis 1981:18) and can be expected throughout Mexico. Given the known distributions from Riley and Solis (2005) and Rodriguez del Bosque (2009, 2012) (pending further collecting), the following guidelines are offered. With the exception of Chihuahua (where *D. grandiosella* occurs), *D. lineolata* and *D. saccharalis* can be identified from Sonora, Coahuila, Nuevo Leon and Tamaulipas. Identifications from the latter two eastern states are the most accurate because they are farther from the overlap zone with *D. grandiosella*. Anything south of the Border States but north of Veracruz or Oaxaca is probably best left at genus unless the origin is very well documented and sibling species can be eliminated as possibilities. There should be no sibling species of *D. lineolata* south of Veracruz, so if the host is corn, a species identification can be made from extreme southern Mexico.

Sporadic studies throughout Central America make identification of *D. lineolata* from corn possible in a few areas because adults were reared and genitalia examined. Surprisingly, neither Passoa (1983, 1985) working in corn fields or Miller's et al. (2012) list from light trapping and review of collections were able to find any species of *Diatraea* in Honduras except for *D. lineolata* and *D. saccharalis*. The situation is similar in Nicaragua. Van Huis (1981) found that *D. lineolata*, and more rarely *D. saccharalis*, were the only species in corn. A current checklist from Nicaragua (Maes 1999) did not add any corn feeding *Diatraea*. Thus, identification of *D. lineolata* from Honduras and Nicaragua seems safe. King's survey of Central America (King and Saunders 1984) implies that Costa Rica might also be added to the list as there are active surveys in that country. There are too many sibling species of *Diatraea* in other parts of Latin America to expand the authority. The situation is the Caribbean needs to be evaluated on a country by country basis.

Weisman (1986) separated *Chilo* and *Diatraea* by the presence or absence of a middorsal stripe. This character can fade in preserved larvae. In addition, some *Chilo* are spotted and lack stripes like *Diatraea* (for example *C. partellus*, see Hutchison et al. 2008). Identifiers might encounter examples of the less common corn borers on occasion, especially in stems or roots. Some of them are striped (*Xubida*, *Eoreuma*) (Passoa 1985, Agnew et al. 1988).

Morphological guide to known species of *Diatraea* intercepted at U.S. ports of entry from Mexico

Guide to species of *Diatraea* intercepted or potentially encountered at U.S. ports of entry using morphology and origin

Origin records

Diatraea lineolata has been intercepted from the following locations:

Mexico

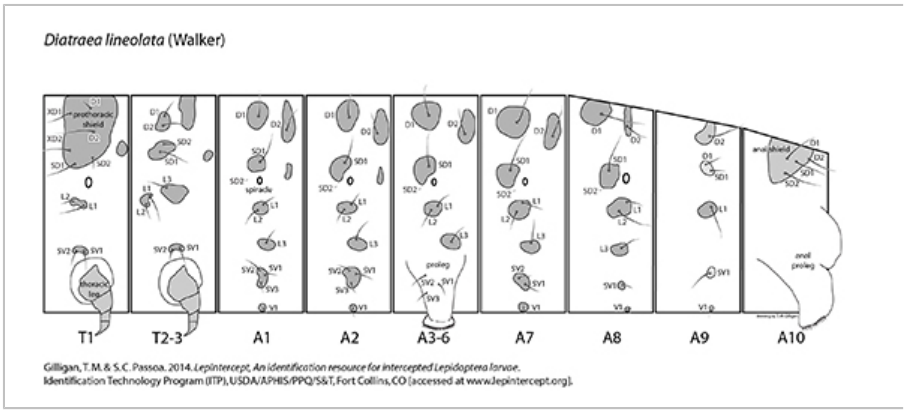
Host records

Diatraea lineolata has been intercepted on the following hosts:

Zea mays

Several other hosts are listed in PestID; however these records must be verified.

Setal map



Diatraea lineolata setal map

Click here to download a full-size printable PDF of this larval setal map