

GUIDE TO SPECIES OF *DIATRAEA* INTERCEPTED OR POTENTIALLY ENCOUNTERED AT U.S. PORTS OF ENTRY USING MORPHOLOGY AND ORIGIN

S. C. Passoa, 2014

Identification of *Diatraea* immatures is risky and tentative in Mexico (Riley and Solis 2005) and does not always work for field collected larvae from Venezuela (Vargas et al. 2013a). Unfortunately, APHIS gets too many interceptions to ignore this group. A tentative key is presented here as a first step to identifying species which may be intercepted at our ports or could be recognized well enough to sort for barcoding. This key depends on having an origin; either a Mexican state or a country in Latin America. Because this key takes into account rarer species, it can be more accurate than just assuming this diversity does not exist. Apart from identification, a goal of this key is to help APHIS to understand the need to capture exact origins and to encourage color photographs, rearing or molecular studies of larval *Diatraea*. This is almost an alert showing how critical such information is to proper identification of even common species. When no specific origin is known for a Mexican *Diatraea* interception, use the morphological key. Extremely cautious identifiers may want to identify the larva to genus and put the results of the key in the comments section if the characters seem to fit. This is a more conservative option.

The below key emphasizes species from corn and sugarcane, especially those in Mexico. Distribution data within Mexico is from Rodríguez del Bosque (2009, 2012) and Solis (2004), but this can change because species do compete and displace one another over time (Rodríguez del Bosque et al. 2011, Rodríguez del Bosque and Reyes-Méndez 2013). Three species of Mexican *Diatraea* still have unknown larval stages and hosts (Solis 2004).

Currently, *D. lineolata* is assumed to occur throughout Mexico and is the only corn borer in Sonora, Coahuila and from Durango south to Hidalgo. Caribbean records are taken from Rodríguez del Bosque et al. (1988), the status of *D. lineolata* in the Caribbean needs study. Separation of *D. lineolata* from *D. grandiosella* and *D. considerata* from *D. magnifactella* is inconsistent. Some specimens fit the diagnosis in the data sheets, others are inconclusive. That is the state of the art for now. Identification of *D. lineolata* from *D. saccharalis* is more accurate, reference is made to the data sheet for *D. lineolata* and morphological key instead of repeating the same information several times for the corn feeding species. Some characters were taken from Weisman (1974), Passoa (1985), Stehr (1987) and Riley and Solis (2005). Because of the historical value of the Box collection (see data sheet on *D. considerata*), it was not possible to dissect mouthparts or search for the exact position SD2 seta of A8 by making slide mounts.

Other Caribbean records are from Fallon (undated). Only two species are common in Brazilian sugarcane according to Freitas et al. (2006, 2007). Their black and white illustration of *D. flavipenella* was used to contrast against *D. saccharalis*. The illustration of *D. centrella* by Guagliumi (1962: 260) in combination with Linares and Bastidas (1996) was used to tentatively diagnose sugarcane borers in Venezuela. The illustrations of Linares and Bastidas (1996) did not always match the key with regard to the D setae. When in doubt, the key was assumed correct except for recoding the mandibular teeth from their illustrations. Vargas et al. (2013b) discussed identification of sugarcane borers in Colombia as did Parada et al. (2007). The larva illustrated by Parada et al. 2007 as *Diatraea* near *grandiosella* would key out to *D. tabernella* in this document based on body color. Pastrana and Hernandez (1979) mentioned only *D. saccharalis* in their key to caterpillars on corn in Argentina. If no country is mentioned, I was unsure of the current situation or the region has too many species with unknown larvae to hazard a guess (Costa Rica being a good example of this problem). There is just not enough information on the less common species eating grass to include these taxa. The same is true for interceptions with doubtful origins. Early instars can only be identified to genus, and sometimes only to subfamily. *Diatraea* are only one of several crambid or pyralid borers found in corn or sugarcane.

1. Origin unknown (but definitely New World) or from any host except corn or sugarcane in the Poaceae	<i>Diatraea</i> sp.
1'. Origin known with certainty and from corn or sugarcane	2
2. From corn.....	3
2'. From sugarcane	11
3. From Mexico.....	4
3'. From another part of Latin America	7
4. From Nuevo León and Tamaulipas or south of Veracruz	
..... <i>D. lineolata</i> , <i>D. saccharalis</i> (see morphology key/data sheet)	
4'. From another part of Mexico	5
5. From Sonora, Coahuila and Durango directly south to Hidalgo	<i>D. lineolata</i>
5'. From another part of Mexico	6

6. From Chihuahua, Sinaloa, Nayarit, Jalisco or Michoacán.....	
.....	<i>D. lineolata</i> , <i>D. grandiosella</i> (see morphology key/data sheet)
6'. From the rest of Mexico (Veracruz, Morelos, Guerrero and surrounding states).....	
.....	<i>Diatraea</i> spp. (<i>grandiosella</i> , <i>lineolata</i> , <i>muellerella</i> or <i>postlineella</i>)
7. From Honduras or Nicaragua.....	
.....	<i>D. lineolata</i> , <i>D. saccharalis</i> (see morphology key/data sheet)
7'. From another part of Latin America	8
8. From the Caribbean.....	9
8'. From South America	10
9. From the Bahamas, Cuba, Grenada, Trinidad or Tobago	
.....	<i>D. lineolata</i> , <i>D. saccharalis</i> (see morphology key/data sheet)
9'. From Puerto Rico, Jamaica, Dominican Republic, St Kitts or Barbados	
.....	<i>D. saccharalis</i>
10. From Argentina.....	<i>Diatraea saccharalis</i>
10'. From another part of South America	<i>Diatraea</i> sp.
11. From Mexico.....	12
11'. From another part of Latin America	16
12. From Veracruz, Morelos, Guerrero, or Tabasco.....	
.....	<i>Diatraea</i> spp. (<i>D. grandiosella guatematella</i> , <i>magnifactella</i> , <i>muellerella</i> , <i>saccharalis</i> , or <i>veracruzana</i>)
12' From another part of Mexico	13
13. Frontal pores well below a line connecting the F1 setae; SD1 pinacula extends to middle of the spiracle on A3-6; paraproctal setae only half as long as SV1 on A9; from Chihuahua to Sinaloa, south to Michoacán and west to Veracruz.....	<i>D. grandiosella</i>
13'. Frontal pores in line, with or only slightly below, the F1 setae; SD1 pinacula extends to the top of, or only slightly below, the spiracle on A3-6; paraproctal setae almost as long as SV1 on A9	14
14. Head reddish brown; markings, if present, tend to be subdorsal, dark purple to brown and longitudinal; body pinacula golden brown; D2 on A1-7 tend to be on oval to rectangular pinacula; anal shield usually pale; Nuevo León and Tamaulipas south along the eastern coast until Guerrero, Puebla and Veracruz, then throughout the rest of Mexico and Latin America.....	<i>Diatraea saccharalis</i>

14'. Head honey colored; markings, if present, can be in the lateral region, and are light purple to pink and transverse; D2 on A1-7 tend to be on thin band like pinacula; anal shield often pigmented.....	15
15. SD2 minute and below the middle of the SD1 pinaculum on A8; from approximately a line connecting Nayarit to the southern tip of Tamaulipas south until Oaxaca and Veracruz, also Tabasco and Quintana Roo.....	<i>D. magnifactella</i>
15'. SD2 on A8 not visible, or somewhere in front of the middle of the SD1 pinaculum; from Sinaloa south to Michoacán	<i>D. considerata</i>
16. From Brazil	17
16'. From another part of South America	18
17. Head pale (possibly honey colored), body cream; from Alagoas and a few other states in the northeastern region.....	<i>D. flavipenella</i> (late instars)
17'. Head reddish-brown, dark; body often dirty white; widespread in Brazil.....	<i>D. saccharalis</i> (late instars)
18. From Venezuela or Colombia; non-diapausing forms with pigmented pinacula	19
18'. From another part of South America or pale larva with no obvious pinacula	<i>Diatraea</i> sp.
19. From Venezuela.....	22
19'. From Colombia	20
20. Larva cream colored; median indentation does not divide the mesothoracic extra pinacula in half.....	<i>D. tabernella</i>
20'. Larva dirty white; median indentation absent or nearly divides the mesothoracic extra pinacula in half.....	21
21. Median indentation nearly divides the mesothoracic extra pinacula in half; body sometimes with purple markings	<i>D. indigenella</i>
21'. Median indentation absent on the mesothoracic extra pinacula; no purple markings on body.....	<i>Diatraea saccharalis</i>
22. Distance between Af1 and Af2 equal to or slightly more than the distance separating Af1 from F1; prothoracic shield mahogany brown; A8 with D1 on the same pinaculum and D2 on separate pinacula	23

- 22'. Distance between Af1 and Af2 is about two times the distance separating Af1 from F1; prothoracic shield dark brown to almost black; A8 with D1 on separate pinacula and D2 on a single pinaculum24
23. Mandible with four teeth; mesothoracic and metathoracic extra pinacula triangular, not oval, with the anterior margin pointed; anal crochets in a semicircle *D. centrella*
- 23'. Mandible with five teeth; mesothoracic and metathoracic extra pinacula oval with a median indentation; anal crochets in an short arc*D. impersonatella*
24. Mandible with five teeth; mesothoracic and metathoracic extra pinacula oval with a slight median indentation; anal crochets in a short arc *D. saccharalis*
- 24'. Mandible with four or five teeth; mesothoracic and metathoracic extra pinacula almost form a horizontal “8”; anal crochets in an arc or semicircle25
25. Mandible with four teeth; anal crochets in a short arc *D. buskella*
- 25'. Mandible with five teeth; anal crochets in an semicircle*D. rosa*

This key was produced and distributed as part of LepIntercept. Please cite as follows:

Passoa, S. C. 2014. Guide to species of *Diatraea* intercepted or potentially encountered at U.S. ports of entry using morphology and origin, 5 pp. In: Gilligan, T. M. and S. C. Passoa. LepIntercept, An identification resource for intercepted Lepidoptera larvae. Identification Technology Program (ITP), USDA/APHIS/PPQ/S&T, Fort Collins, CO. [accessed at www.lepintercept.org].