KEY TO THE IDENTIFICATION OF *HELICOVERPA ARMIGERA* SUSPECTS INTERCEPTED AT U.S. PORTS OF ENTRY

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The following key is for identification of *Helicoverpa armigera* suspects at United States ports of entry. Larvae should be in the subfamily Heliothinae, have no microspines on the body pinacula (one exception in Africa), and have most of the characters listed in the first couplet. Some problems and assumptions with identification of *H. armigera* are discussed in detail on the *H. armigera* fact sheet on LepIntercept. The distribution of rare African and Hawaiian species follows Hardwick (1965); none of these are known to have become widely distributed since publication of that work. Matthews and Jago (1993) confirmed that *H. fletcheri* is restricted to the Sahel region of Africa. A young larva of *H. assulta* was illustrated by PaDIL (click here for link). Species unlikely to be intercepted at U. S. ports are placed in brackets. For a key to species related to *H. armigera*, consult the Heliothinae guide on the Keys page of LepIntercept.

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1. D setae of A1-8 inserted on large conical chalazae, those of A1, A2 or A8 often larger than the rest; body color highly variable, but usually with lines and stripes and sometimes a black bar joining the D setae of A1 or A2; if the setal bases are small, then the mandible has a minute tooth on the inner rib and no large retinaculum ..... 2 (*H. armigera* suspect)
1'. D setae of A1-8 not inserted on large conical chalazae, those of A1, A2 or A8 often equal in size to the other setal bases; body color highly variable, but usually without lines and stripes and not with a black bar joining the D setae of A1 or A2; mandible lacks a minute tooth on the inner rib ..... not an *H. armigera* suspect

2. From Africa 3
2'. From other parts of the Old World (including Hawaii) 6
2''. From Central America, South America, or the Caribbean 18

3. From North African countries bordering the Mediterranean Sea .....*H. armigera*
3'. From Central and southern Africa 4

4. Pinacula with microspines on A9 (Mathews and Jago 1993: fig. 740); restricted to parts of the Sahel (Sudan, Niger, Nigeria, Ghana, or Senegal); millet and other crops .....[*H. fletcheri*]
4'. Pinacula without microspines on A9; from Central or southern Africa; various hosts 5

5. From Madagascar, Zimbabwe (Southern Rhodesia of Hardwick 1965), Tanzania (Tanganyika of Hardwick 1965) or Kenya .....*Helicoverpa* sp. (*H. armigera*, [*H. toddi*])
5'. Not from Madagascar, Zimbabwe, Tanzania, or Kenya; on Solanaceae; dorsal and subdorsal areas of A1-8 with fine spines evenly distributed (Sannino et al. 1993: fig. 5)..... *H. assulta*
5''. Not from Madagascar, Zimbabwe, Tanzania, or Kenya; on other hosts, including Solanaceae; dorsal and subdorsal areas of A1-8 with spines in sinuate longitudinal bands (Bejakovich and Dugdale 1998: fig. 34) .....*H. armigera*

6. From Europe, the Middle East and western Russia 7
6'. From other parts of the Old World 9

7. From the Netherlands 8
7'. From other areas of Europe, the Middle East or western Russia .....*H. armigera*

8. From Netherlands vegetables .....*H. armigera*
8'. From Netherlands cut flowers (doubtful orgin) .....*Helicoverpa* sp.

9. From the Pacific Islands (including Hawaii) 10
9'. From Asia and Australia 12

10. From any Pacific Island except Hawaii or Jarvis Island 11
10'. From Hawaii or Jarvis Island .....
.....*Helicoverpa* sp. ([*H. confusa*, *H. hawaiiensis*, *H. minuta*, *H. pallida*], *H. zea*, or [*H. pacifica*])

11. From Solanaceae, dorsal and subdorsal areas of A1-8 with fine spines evenly distributed (Sannino et al. 1993: fig. 5) .....*H. assulta*
11'. From other hosts, including Solanaceae; dorsal and subdorsal areas of A1-8 with spines in sinuate longitudinal bands (Bejakovich and Dugdale 1998: fig. 34) .....*H. armigera*

12. From New Zealand (from Bejakovich and Dugdale 1998) 13
12'. From another part of Asia 15

13. Segments A1-A7 with SDl and L2 pinacula large and closely spaced; microspines in irregular patches around D, SD and L pinacula .....*H. assulta*
13'. Segments A1-A7 with SDl and L2 pinacula not closely spaced; microspines in wide longitudinal bands on dorsal midline, between setae D2 and L2, and between setae L1 and L3.....
.....14

14. Peritreme of spiracle usually pale brown in late instars; microspines absent below ventral margin of seta SDl on segments Al-A6; platelets between microspines sparse ..... *H. punctigera*
14'. Peritreme of spiracle black in all instars; microspines present below ventral margin of seta SDl on segments Al-A6; platelets between microspines dense, giving a cobbled appearance ....*H. armigera*

15. From Australia .....*Helicoverpa* sp. (*H. assulta*, *H. armigera*, *H. punctigera*, [*H. prepodes*])
15'. From another region of Asia 16

16. From Tibet .....*Helicoverpa* sp. (*H. armigera*, *H. assulta*, [*H. tibetensis*])
16'. From the rest of Asia except New Zealand, Australia, or Tibet 17

17. From Solanaceae, dorsal and subdorsal areas of A1-8 with fine spines evenly distributed (Sannino et al. 1993: fig. 5) ..... *H. assulta*
17'. From other hosts, including Solanaceae; dorsal and subdorsal areas of A1-8 with spines in sinuate longitudinal bands (Bejakovich and Dugdale 1998: fig. 34) .....*H. armigera*

18. Pinacula of A1, A2 and A8 covered with microspines..... *Chloridea* sp. (= *Heliothis*)
18'. Pinacula of A1, A2 and A8 lacks microspines, or at most, with only a few around the edges... 19

19. From Central America, Ecuador, Colombia, Venezuela, or the Caribbean ..... *H. zea*
19'. From the rest of South America (including Brazil) ....*Helicoverpa* sp. (*H. zea*, *H. armigera*, *H. gelotopoeon*, etc.)

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