

LepIntercept

An identification resource for intercepted Lepidoptera larvae



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NOCTUIDAE - *Mamestra brassicae* (Linnaeus)

Taxonomy

Noctuoidea: Noctuidae: Noctuinae (s.l.): *Mamestra brassicae* (Linnaeus)

Common names: cabbage moth

Synonyms: *Phalaena omicron*, *Noctua albidilinea*, *Hypobarathra unicolor*

Larval diagnosis (Summary)

- Large retinaculum on the mandible
- SD1 and SD2 on the mesothorax and metathorax connected to a tonofibrillary platelet by a minute dark bar
- Black spots surround the abdominal spiracles
- Spinneret about four times as long as first segment of labial palpi
- Abdominal prolegs with a sclerotized shield

Host/origin information

More than 92% of the interception records for *M. brassicae* are from the Netherlands. The most common hosts are listed below:

Origin	Host(s)
Netherlands	<i>Aconitum</i> , <i>Amaranthus</i> , <i>Brassica</i> , <i>Delphinium</i>

Recorded distribution

A Palearctic species, *Mamestra brassicae* is found from Europe to Japan and subtropical Asia (including India). It is also present in North Africa (Canary Islands, Libya, and Morocco) (Carter 1984).

Identification authority (Summary)

Accurate identification of *M. brassicae* involves origin, morphology, and color pattern. Because this pest is polyphagous, the hostplant offers few clues in spite of the common name. A positive identification can be made if the specimen possesses all of the morphological characters listed above (not just the proper mandible) and originates from within the recorded distribution for this species.

Pest characterization

(Based on Cavey 2001, Carter 1984)

- Taxonomy: **High**. Species identification is possible in late instars.
- Distribution: **High**. *Mamestra brassicae* is not present in the U.S.
- Potential Impact: **High**. *Mamestra brassicae* is a serious pest.

This ranking characterizes *Mamestra brassicae* as quarantine significant for the U.S.

Larval diagnosis (Detailed)

Various instars of the cabbage moth, *Mamestra brassicae*, were described in detail by Sannino and Espinosa (1999). Other morphological details were illustrated by Weisman (1986), Merzheevskaya (1988), Beck (1999-2000), and Ahola and Silvonon [2008]. Gomez de Aizpurua (2002), Porter (1997), Beck (1999-2000), and Ahola and Silvonon [2008] illustrated the larva in color.

Weisman (1986) used several characters to recognize *M. brassicae*. These included having a retinaculum (= basal process, inner tooth) on the mandible and both SD setae of the mesothorax and metathorax connected to a tonofibrillary platelet (= muscle attachment) by a minute dark bar. Beck (1999-2000), in his revision of European noctuid larvae, added the following

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Fig. 1: Late instar, lateral view

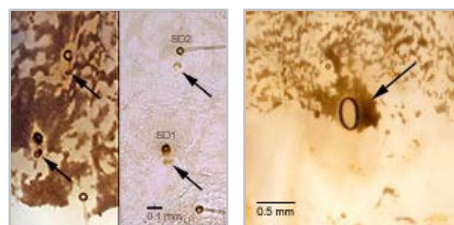


Fig. 2: SD1-2 on T2

Fig. 3: Spiracle



Fig. 4: A3 with proleg

Fig. 5: Proleg



Fig. 6: Crochets

Fig. 7: Head



Fig. 8: Hypo. complex

Fig. 9: Mandible

morphological features: spinneret about four times as long as first segment of labial palpi, sixteen stout spinelike blades present on the hypopharyngeal complex and abdominal prolegs with a sclerotized shield. The mouthpart drawings in Ahola and Silvonen [2008: 570] agree with Beck's (1999) description. A long spinneret was used by Merzheevskaya (1988) to separate *M. brassicae* from related species in the western Russian fauna. Sannino and Espinosa (1999) called attention to a characteristic almost circular yellow spot between stemma one and stemma two. The dorsally grooved spinneret and hairlike SD1 on A9 (Ahola and Silvonen [2008]) in *M. brassicae* is typical for the subfamily Noctuinae (s.l.) as defined in the broad sense to include the Hadeninae (Lafontaine and Fibiger 2006).

Although the larva of *M. brassicae* is very variable in color and pattern (Beck 1999-2000), these characters are important. Whittle (1986) and Gomez de Aizpurua (2002) illustrated two larval color forms of *M. brassicae*. Middle instars are green with a broad white spiracular stripe that passes through the spiracles on A1-7 and below the much larger spiracle of A8. Mature larvae may or may not have dorsal markings like a chevron. There is often a thin dark transverse line (cross bar) on A8 (Sannino and Espinosa 1999). Although these features are characteristic of *M. brassicae*, they do occur on other noctuid genera as well. The most distinctive marking is a black spot which surrounds the abdominal spiracles (Ahola and Silvonen [2008: 394]). This pattern is also found on *Lacanobia suasa* (Merzheevskaya 1988, Porter 1997), but that species does not have a long spinneret or blades on the hypopharyngeal complex (Beck 1999). One common North American species, *Orthosia rubescens*, has the spiracles surrounded by black markings (Wagner et al. 2011) in a pattern similar to *M. brassicae*. However, the mouthparts of the two species are completely different (see Godfrey 1972).

The first instar of *M. brassicae* has pigmented body pinacula and a characteristic prothoracic shield pattern illustrated by Sannino and Espinosa (1999). The outer margins of the shield are outlined in black enclosing two spots. The caption to Figure 4 of their paper calls it a prothoracic shield - this is a misprint for anal shield.

Identification authority (Detailed)

Accurate identification of *M. brassicae* involves origin, morphology, and color pattern. Because this pest is polyphagous, the hostplant offers few clues in spite of the common name.

Carter (1984) gave the distribution of *M. brassicae* as "throughout the Palearctic Region from Europe to Japan and into subtropical Asia, including India." There is a map which shows two African localities, Libya and the Canary Islands in Whittle (1986). From time to time, identifiers submit presumed *M. brassicae* specimens from central Africa. This is slightly, but significantly, outside the known range of this pest. Because the climate and plants are different in the northern and central regions of Africa, not all parts of Africa may be ecologically suitable for *M. brassicae*; indeed, neither Forsyth (1966) in Ghana nor Schmutterer (1969) on pests of crops in central and northeastern Africa include *M. brassicae* in their works. On the other hand, Whittle (1986) suggests that records from Greece, Japan, and Morocco for *M. brassicae* are errors representing transshipments. There is nothing unusual about any of these three countries given the above synopsis of the known distribution. The best solution is to restrict *M. brassicae* identifications to origins consistent with the known distribution of the pest. Of course, New World records for *M. brassicae* are suspect unless there is evidence of transshipment or other similar circumstance.

In the past, identifiers using Weisman (1986) often stopped at *M. brassicae* after seeing the proper mandible without paying attention to other characters or clues. It is important to understand that a retinaculum is present in hundreds of species of Noctuidae or Erebidae worldwide. Even the minute SD bars are common in many related species. Moreover, it is not clear which instars of *M. brassicae* have the retinaculum or if it can be worn off (see fact sheet on *H. virescens*).

Although Beck (1999-2000) and Ahola and Silvonen (2005, [2008]) often give long detailed color descriptions in their keys, most of these are rarely useful to PPQ because all larvae are killed before submission to the port identifier. This results in specimens with faded or lost colors. In some groups, given the ease of taking digital photos, it might be better to submit color photos with suspects of key program pests. *Mamestra brassicae* would be a good example of this need; identifications are much less accurate on faded preserved specimens. Specimens without any pattern or color should be left as "Noctuinae complex" if SD1 is hairlike on A9.

Origin records

Mamestra brassicae has been intercepted from the following locations:

Bosnia and Herzegovina, China, France, Israel, Italy, Japan, Lebanon, Mongolia, Morocco, Netherlands, Portugal, South Korea, Spain

Locations from outside of the known distribution for this species likely represent misidentifications and are not listed here.

Host records

Mamestra brassicae has been intercepted on the following hosts:

Achillea sp., *Aconitum napellus*, *Aconitum* sp., *Ageratum* sp., *Alchemilla* sp., *Allium porrum*, *Alocasia* sp., *Alstroemeria* sp., *Amaranthus caudatus*, *Amaranthus* sp., *Ammi majus*, *Anemone coronaria*, *Anemone* sp., *Antirrhinum majus*, *Apium graveolens*, *Asclepias* sp., *Asclepias tuberosa*, *Astilbe* sp., *Astrantia* sp., *Brassica* sp., *Brassica oleracea*, *Brassica oleracea* var. *botrytis*, *Brassica pekinensis*, *Brassica* sp., *Bupleurum griffithii*, *Bupleurum* sp., *Calendula* sp., *Callistephus* sp., *Campanula* sp., *Capsicum annuum*, *Capsicum* sp., *Celosia* sp., *Chenopodium* sp., *Chrysanthemum* sp., *Cichorium* sp., *Consolida ajacis*, *Cotinus* sp., *Crocsmia* sp., *Cucumis* sp., *Curcubita* sp., *Cymbidium* sp., *Dahlia* sp., *Daucus* sp., *Delphinium* sp., *Deutzia* sp., *Dianthus* sp., *Dryopteris* sp., *Eryngium alpinum*, *Eryngium* sp., *Eupatorium* sp., *Eustoma grandiflorum*, *Eustoma* sp., *Freesia* sp., *Gentiana* sp., *Gloriosa* sp., *Helenium* sp., *Helianthus* sp., *Helleborus* sp., *Hydrangea* sp., *Hypericum* sp., *Lactuca sativa*, *Lamiaceae*, *Lathyrus* sp., *Leonotis* sp., *Leucospermum* sp., *Lilium* sp., *Lisianthus* sp., *Lycopersicon* sp., *Lysimachia* sp., *Mentha* sp., *Origanum vulgare*, *Paeonia*

