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NOCTUIDAE - *Trichoplusia ni* (Hübner) *Non-Rep*

Taxonomy

Noctuoidea: Noctuidae: Plusiinae: *Trichoplusia ni* (Hübner)

Common names: cabbage looper, cabbage worm

Synonyms: *Plusia innata*, *Autographa brassicae*

Larval diagnosis (Summary)

- Vestigial prolegs on A3 and A4
- Second and third ridge of the mandible extending to the scissorial teeth
- Smooth cuticle with minute granules (not microspines) under high magnification
- Equally spaced mesothoracic pinacula

Host/origin information

Trichoplusia ni is highly polyphagous and can be found on nearly any host plant. It is most commonly intercepted from Mexico (73% of records), Colombia, and Peru, on the following hosts:

Origin	Host(s)
Colombia	*Ocimum*
Mexico	*Brassica*, *Coriandrum*, *Mentha*, *Ocimum*, *Salvia*
Peru	*Ocimum*

Recorded distribution

Trichoplusia ni is widely distributed in temperate regions around the world, with a few exceptions. In the New World, it is present from Canada to Argentia. In the Old World, its distribution is more sporadic. It is present in most regions but is absent from Australia, Northern Europe, Russia, and parts of Africa and Asia.

Identification authority (Summary)

For the New World, identification to species is rarely necessary; it is best to just stop at subfamily if the larva is in the tribe Argyrogrammatini (*T. ni* and relatives). If a species name is needed for a special risk assessment, the mouthparts can be mounted and larvae identified with existing keys. Because of other unknown Plusiinae, it is safest to identify *Trichoplusia*-like interceptions from most of Africa or Asia only to subfamily

Pest characterization

- Taxonomy: **High.** Species identification is often possible.
- Distribution: **Low.** *Trichoplusia ni* occurs in the U.S.
- Potential Impact: **High.** *Trichoplusia ni* is a pest species.

This ranking characterizes *Trichoplusia ni* as not quarantine significant for the U.S.

Larval diagnosis (Detailed)

The larva of the cabbage looper, *Trichoplusia ni*, has been described many times. Some examples are Crumb (1956), Okumura (1961), Peterson (1962), Eichlin and Cunningham (1978), Godfrey (1987), LaFontaine and Poole (1991), Sannino et al. (1993), Beck (1999-2000), Ahola and Silvonen (2005), and Wagner et al. (2011). LaFontaine and Poole (1991), Beck (1999-2000), Ahola and Silvonen (2005), and Wagner et al. (2011) published colored illustrations of the larva.

Typically, *T. ni* can be recognized by having vestigial prolegs on A3 and A4, the second and third ridges (ribs) of the mandible extending to the scissorial (cutting) teeth, a smooth cuticle with minute granules (not microspines) under high magnification, and the equally spaced mesothoracic pinacula (LaFontaine and Poole 1991). The cuticular texture of *T. ni* was illustrated in Ichinose

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Fig. 1: Late instar, lateral view


Fig. 2: Mid-instar, lateral view


Fig. 3: Early instar, lateral view

Fig. 4: Crochets


Fig. 5: Head


Fig. 6: Head, ventral


Fig. 7: Mandible


Fig. 8: Hypo. complex

(1962: plate 14: 8). For doubtful cases, the raduloid of the hypopharyngeal complex has ten ridges (Eichlin and Cunningham 1978) but this character usually cannot be scored at less than 400x even when slide mounted. The head never has contrasting dark setal bases or a genal line, but early instars do have black thoracic legs and black subdorsal abdominal spots (SPIC), a color pattern similar to *Pseudoplusia includens*. However, the mouthparts of the two species are completely different. Gardner (1947) and Ichinose (1962) used the maxillary palpi to seperate *T. ni* from related species in India and Japan.

Ahola and Silvonen (2005: 265) described *T. ni* as having the distance between D1 and D2 equal to that between D2 and SD2 on the mesothorax, but disagreed with other authors by considering the cuticle as smooth to slightly spiny. Beck (1999: 260) also mentioned the thoracic setal spacing, but he described it as D1, D2 and SD2 being equally spaced on the mesothorax and metathorax.

The vestigial prolegs can be difficult to see in some specimens. It helps to use light from below the specimen and to roll the larva to create different views. SD1 on A9 is hairlike in the Argyrogrammatini, including *T. ni*, so the condition of SD1 can be a helpful clue when trying to find the vestigial prolegs. They are not present unless SD1 is hairlike on A9.

Identification authority (Detailed)

Trichoplusia ni is highly polyphagous and widely distributed. It occurs from Canada to Argentina in the New World but is more sporadic in the Old World (LaFontaine and Poole 1991). The Commonwealth Institute of Entomology map (1974) does not list it from northern Europe, Russia and parts of Africa or Asia. It is absent from Australia (Edwards 1996) and rare under natural conditions in the Netherlands (Bretherton et al. 1983). Otherwise it can be expected from the rest of the world where winter temperatures are mild.

Trichoplusia ni identification is an excellent example of the clash between the theoretical and the practical worlds of quarantine entomology. Of course, species identification of all the interceptions is the goal. But for the New World, given the volume of the interceptions and the lack of time to do dissections, it is rarely worth the effort to try and identify *T. ni* from Mexico, Central America, and usually South America. The host list of *T. ni* reads "like a compendium of herbaceous plants of the world" (LaFontaine and Poole 1991) suggesting that cataloging all the plants infested with this species is of little value when we can assume it could occur on almost any herbaceous host. With limited resources, from a United States perspective, it is best to just stop at subfamily if the larva is in the tribe Argyrogrammatini (*T. ni* and relatives) from the New World. If a species name is needed for a special risk assessment, the mouthparts can be mounted and larvae identified with existing keys.

On the other hand, Weisman (1986) did not list *T. ni* from the Old World. Perhaps he wanted to imply that Old World interceptions should not go to species. Identification of *T. ni* from Europe, North Africa, and the Middle East is possible with Beck (1999-2000) or Ahola and Silvonen (2005). Beardsley (1982) can be used for interceptions from Hawaii. However, Kitching (1987: 144) noted that *Trichoplusia* contains about 50 potentially unrelated species that form one of the most difficult problems to resolve in the systematics of the Plusiinae. Given this uncertainty, it seems safest to identify *Trichoplusia*-like interceptions from most of Africa or Asia only to subfamily.

Origin records

Trichoplusia ni has been intercepted from the following locations:

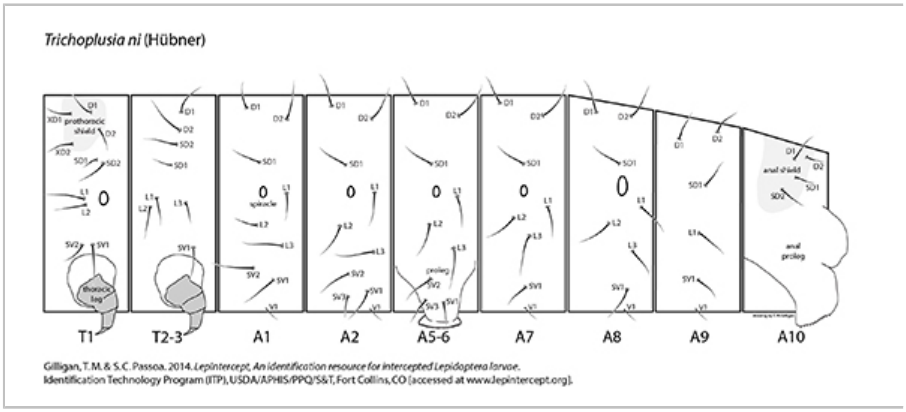
Antigua and Barbuda, Brazil, Canada, Chile, China, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Germany (?), Guatemala, Guyana, Hawaii, Israel, Italy, Jamaica, Kenya, Mexico, Netherlands, Nicaragua, Palestinian Territory, Peru, Yemen

Host records

Trichoplusia ni has been intercepted on the following hosts:

Aconitum sp., *Allium sativum*, *Allium* sp., *Aloe vera*, *Alstroemeria* sp., *Amaranthus caudatus*, *Amaranthus* sp., *Anemopsis californica*, *Anethum graveolens*, *Anethum* sp., *Anthriscus cerefolium*, *Anthurium* sp., *Antirrhinum majus*, *Antirrhinum* sp., *Apium graveolens*, *Apium* sp., *Arachis hypogaea*, *Artemisia abrotanum*, *Artemisia dracunculus*, *Aster* sp., *Basilicum* sp., *Bellis perennis*, *Bellis* sp., *Brassia* sp., *Brassica oleracea*, *Brassica oleracea* var. *acephala*, *Brassica oleracea* var. *alboglabra*, *Brassica oleracea* var. *botrytis*, *Brassica oleracea* var. *capitata*, *Brassica oleracea* var. *italica*, *Brassica pekinensis*, *Brassica rapa*, *Brassica rapa* ssp. *pekinensis*, *Brassica* sp., *Bupleurum* sp., *Callistephus* sp., *Campanula* sp., *Capsicum annuum*, *Capsicum* sp., *Carthamus* sp., *Carthamus tinctorius*, *Celosia* sp., *Cestrum* sp., *Chenopodium berlandieri* ssp *nuttalliae*, *Chrysanthemum* sp., *Citrus* sp., *Coriandrum sativum*, *Coriandrum* sp., *Crotalaria longirostrata*, *Cucurbita maxima*, Cucurbitaceae, *Cymbidium* sp., *Dahlia* sp., *Daucus carota*, *Daucus* sp., *Delphinium elatum*, *Delphinium* sp., *Eruca sativa*, *Fragaria* sp., *Gerbera* sp., *Gloriosa* sp., *Helianthus annuus*, *Helianthus* sp., *Hydrangea* sp., *Hypericum* sp., *Juniperus* sp., *Lactuca sativa*, *Lactuca* sp., Lamiaceae, *Lantana* sp., *Leonotis* sp., *Liatris* sp., *Limonium* sp., *Luffa* sp., *Mathiola* sp., *Matthiola incana*, *Matthiola* sp., *Mentha arvensis*, *Mentha morocco*, *Mentha officinalis*, *Mentha piperita*, *Mentha sachalinensis*, *Mentha* sp., *Moluccella laevis*, *Moluccella* sp., *Musa* sp., *Ocimum basilicum*, *Ocimum* sp., *Ocimum tenuiflorum*, *Oncidium basilicum*, *Opuntia* sp., *Origanum majorana*, *Origanum* sp., *Origanum vulgare*, *Persea americana*, *Persea* sp., *Petroselinum crispum*, *Phaseolus* sp., *Phaseolus vulgaris*, *Piper* sp., *Pisum sativum*, *Polianthes* sp., *Porophyllum* sp., *Portulaca oleracea*, *Prunus domestica*, *Raphanus raphanistrum*, *Rosa* sp., *Rosmarinus officinalis*, *Rosmarinus* sp., *Saccharum* sp., *Salvia officinalis*, *Salvia* sp., *Sandersonia* sp., *Sechium edule*, *Solidago canadensis*, *Solidago* sp., *Spinacia* sp., *Statice* sp., *Tagetes* sp., *Thymus* sp., *Thymus vulgaris*, *Trachelium* sp., *Zea mays*

Setal map



Trichoplusia ni setal map

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