

Lineodes integra (Lepidoptera: Crambidae)

This short description has been prepared in the framework of the EPPO Study on Pest Risks Associated with the Import of Tomato Fruit. The whole study can be retrieved from the EPPO website.

EPPO (2015) EPPO Technical Document No. 1068, EPPO Study on Pest Risks Associated with the Import of Tomato Fruit. EPPO Paris [\[link\]](#)

Africa	Asia	Oceania	North America	South-Central America and Caribbean
--------	------	---------	---------------	-------------------------------------

Lineodes integra (Lepidoptera: Crambidae) (eggplant leafroller, nightshade leaf tier)

Why	Identified in the EPPO tomato study. The main source of data on this pest was a data sheet in Hayden (2013). Very little information could be found on its biology and distribution, and no mention of its importance or control.
Where	<p>This pest occurs in all parts of the Americas and in the Caribbean, but its distribution (other than North America) is not clear.</p> <p>EPPO region: absent</p> <p>North America: Canada (Ontario) (OMNR, 2000); Mexico (Hayden, 2013), USA (Alabama, California, Florida, Louisiana, Mississippi, Texas, Illinois, Wisconsin, Washington (Hayden, 2013) Michigan, Nebraska (NatureSearch, 2008) Iowa (Insects of Iowa, 2008).</p> <p>Hayden (2013) mentions that it is present from Florida to California, and as far north as Illinois, Wisconsin, and Washington (Hayden, 2013). It may occur in States that are in-between and not listed above (not fully checked).</p> <p>Central America: Costa Rica, Honduras (Hayden, 2013), Nicaragua (Maes and Tellez Robleto, 1988; Maes, ND).</p> <p>Caribbean: Bahamas (Hayden, 2013). Cuba (Wikipedia citing Nunez Aguila and Barro Canamero, 2012; Patterson, ND citing the same, Ecosis ND);</p> <p>Note: Maes (ND) lists Jamaica, Granada, Cuba (citing Maes and Tellez, 1988, which does not contain this information). No other record were retrieved for Granada and Jamaica</p> <p>South America: Argentina, Brazil (Hayden, 2013), Chile? (no other record found. Only Nature Search, 2008), Ecuador (at least Galapagos, introduced in 1989; DII Galapagos, 2013), Uruguay (Biezanko et al., 1974)</p> <p>Note: Maes (ND) lists Colombia and Brazil (citing Maes and Tellez, 1988, which does not contain this information). No other record was found for Colombia. For Brazil, only an old record was found (listing Lepidoptera in Florida) was (Grossbeck, 1917).</p> <p>Note: Boldsystems (2013) includes specimens for USA, Mexico, Ecuador, Argentina, Costa Rica.</p>
Climatic similarity	High. 13 common climates considering the countries listed above, which is probably the case as the pest has a wide distribution in the USA.
On which plants	The main hosts seem to be eggplant, tomato and <i>Physalis</i> . Other hosts mentioned are <i>Capsicum annuum</i> , <i>Nicotiana glauca</i> (tree tobacco), <i>Solanum angustifidum</i> , <i>S. asperum</i> , <i>S. carolinense</i> , <i>S. incarceratum</i> , <i>S. lycopersicum</i> , <i>S. melongena</i> , <i>S. torvum</i> , <i>S. tuberosum</i> , <i>S. umbelliferum</i> , " <i>S. verbascifolium</i> ", <i>S. viarum</i> , <i>S. xanti</i> , <i>Solanum</i> spp. (Hayden et al., 2013). <i>Capsicum</i> spp, <i>Nicotiana</i> spp. (DII Galapagos, 2013), tobacco (Biezanko et al., 1974), <i>Physalis peruviana</i> and <i>P. philadelphica</i> (Solis, 2006).
Damage	(All from Hayden, 2013) Damage is done by larvae, which feed on leaves, occasionally on the surface of petioles and at the surface of fruits (at all stages, buds to ripe - they do not bore into the fruit). On leaves, larvae web leaves and hide in withered foliage. They feed on fruit when in high densities. Pupation occurs on the plant (rolled leaf edge, axil or crevices of the stem).
Dissemination	Adults fly. No details were found.
Pathway	Plants for planting, fruit and vegetables of host plants from countries where <i>L. integra</i> occurs.
Possible risks	USDA (2009) reports 3 interceptions on tomato fruit in the USA. Hypothesis is made that it was imported to northern USA by nursery plants (NatureSearch, 2008). Solis (2006) lists interceptions on <i>Capsicum</i> sp., <i>Lavandula</i> sp., <i>Physalis peruviana</i> , <i>Physalis philadelphica</i> , <i>Solanum lycopersicum</i> , <i>Solanum torvum</i> , <i>Thymus</i> sp. (Solis, 2006).
Possible risks	Solanaceae are major crops in the EPPO region. The climatic similarity according to the EPPO Study between the area where it occurs and the EPPO region is high. There is a lack

Categorization
Sources

of information on this pest, and its present importance. No mention of the pest's importance or control was found.

None found.

Biezanko CM, de Ruffinelli A, Link D. 1974. Plantas y otras sustancias alimenticias de las orugas de los lepidópteros uruguayos. Rev. Centro Ciencias Rurais, Santa Maria, 4(2): 107-148.

BugGuide. 2009. <http://bugguide.net/> (Accessed December 2013)

DII Galapagos. 2013. Database of Invertebrates Introduced to Galápagos, Fundación Charles Darwin, Islas Galápagos. http://rockbugdesign.com/invert_ref/en/species/show/473/ (Accessed December 2013)

Ecosis. ND. Diversidad biológica cubana.

http://www.ecosis.cu/biocuba/biodiversidadcuba/05_animalia/06_insecta1.html

Grossbeck JA. 1917. Article I. -Insects Of Florida. IV. Lepidoptera. (Edited By Frank E. Watson). In Bulletin of The American Museum Of Natural History. Volume XXXVII, 59:57,8(75.9), 1917.

Hayden, J.E., S. Lee, S.C. Passoa, J. Young, J.-F. Landry, V. Nazari, R. Mally, L.A. Somma, and K.M. Ahlmark. 2013. Digital Identification of Microlepidoptera on Solanaceae. USDA-APHIS-PPQ Identification Technology Program (ITP). Fort Collins, CO. <<http://idtools.org/id/leps/micro/>> - See more at: http://idtools.org/id/leps/micro/about_citation.php#sthash.jhPVIFrD.dpuf (Accessed December 2013)

Insects of Iowa. 2008. http://www.insectsofiowa.com/Moths/families/63-06%20-%20live%20crambidae_pyraustinae%204934-5298.htm

Maes JM and Tellez Robleto J. 1988. Catálogo de los insectos y artrópodos terrestres asociados a las principales plantas de importancia económica en Nicaragua. Rev. Nica. Ent., 5:1-95.

Maes JM. ND. Fauna entomologica de Nicaragua. Lepidoptera, Pyralidae. <http://www.bio-nica.info/Ento/Lepido/PYRALIDAE.htm>

Nature Search. 2008. Eggplant leafroller. *Lineodes integra*. Fontenelle Nature Association.

http://www.fnanaturesearch.org/index.php?option=com_naturesearch&task=view&id=1958 (Accessed December 2013)

Núñez Aguila R, Barro Cañamero A. 2012. A list of Cuban Lepidoptera (Arthropoda: Insecta). Zootaxa 3384: 1-59

OMNR. 2000?. Ontario Butterflies and Moths.xls. Available at <http://find.gov.on.ca/?q=lineodes&search.x=-1063&search.y=-143&type=ANY&searchType=simple&offset=0&lang=en&url=http%3A%2F%2Fwww.mnr.gov.on.ca&collectio n=&owner=mnr> (other publication on same site does not seem accessible) (Accessed December 2013)

Patterson B. ND. Checklist of the Lepidoptera of the Antilles.

<http://mothphotographersgroup.msstate.edu/Antilles/AntillesChecklist.shtml>

Solis A. 2006. Key To Selected Pyraloidea (Lepidoptera) Larvae Intercepted At U. S. Ports Of Entry: Revision Of Pyraloidea In "Keys To Some Frequently Intercepted Lepidopterous Larvae" By Weisman 1986. USDA. <http://www.ars.usda.gov/SP2UserFiles/Place/12754100/PyraloideaKey.pdf> (Accessed December 2013)

Notes: original description available here (in German): <http://www.archive.org/stream/verhandlungender2373zool#page/327/mode/1up>

Not found: Campbell, R.E. 1938. The pyralid moth, *Lineodes integra* Zell., as a pest of eggplant. Journal of Economic Entomology 31: 457-458.