

Spodoptera latifascia and *S. cosmioides* (Lepidoptera: Noctuidae)

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
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Spodoptera latifascia and *S. cosmioides* (Lepidoptera: Noctuidae) (*S. latifascia*: garden armyworm, lateral lined armyworm)

Why	<p>Identified in the EPPO tomato study as <i>S. latifascia</i> (syn. <i>S. cosmioides</i>), and one of many American <i>Spodoptera</i> species reported as attacking tomato. <i>S. cosmioides</i> was originally listed as a synonym of <i>S. latifascia</i>, in line with several publications (incl. PQR). However, others consider them as separate species based on Silvain and Lalanne-Cassou (1997) and Lalanne-Cassou et al. (1999). In particular there are many recent Brazilian publications on <i>S. cosmioides</i>. The situation is not clear, especially with regards to the geographic distribution, and to which species distribution records refer to (if there are two separate species). Both species are reported as attacking tomato.</p>
Where	<p>Some authors may consider <i>S. cosmioides</i> as a synonym of <i>S. latifascia</i> and give one distribution (Heppner, 1998, possibly CABI CPC). Zagatti et al (1995-2006) note that <i>S. latifascia</i> occurs in Central America, and is replaced in South America by the sibling species <i>S. cosmioides</i>, information also repeated in, for example, Bavaresco et al. (2004). However, the situation seems more complicated as some publications list both <i>S. latifascia</i> and <i>S. cosmioides</i> in Brazil (Silvie and Silvain, 2004?). If <i>S. cosmioides</i> is a different species, it seems that it occurs only in South America, while <i>S. latifascia</i> occurs from southern USA to South America (at least in Brazil).</p> <p>EPPO region: absent</p> <p>North America: USA (Florida) (Heppner, 1998), straying north to South Carolina and Arkansas; Mexico (CABI CPC). These records are understood to refer to <i>S. latifascia</i>. No reference was found to <i>S. cosmioides</i> for North America.</p> <p>Central America: Belize, Honduras (CABI CPC) Honduras (Passoa, 1991). No reference was found to <i>S. cosmioides</i> for Central America. These records are understood to refer to <i>S. latifascia</i>.</p> <p>Caribbean: Antigua and Barbuda, Barbados, Belize, Cayman Islands, Cuba, Dominica, Honduras, Jamaica, Leeward Islands, Puerto Rico, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, Windward Islands (CABI CPC). Throughout Caribbean, south to Central America and South America (Heppner, 1998) Guadeloupe, Martinique, throughout the Antilles (Jamaica: type specimen of <i>S. latifascia</i>). (Zagatti et al, 1995-2006), Jamaica, Cuba, Hispaniola (Haiti plus Dominican Republic), Puerto Rico, Virgin Islands, French West Indies, St. Vincent Group (Patterson, ND citing others) – Main catalogues, like Zagatti et al (1995-2006) and Patterson (ND) do not mention <i>S. cosmioides</i> in the Caribbean. These records are understood to refer to <i>S. latifascia</i>.</p> <p>South America: <i>S. latifascia</i>: Brazil (Santos et al., 1980). Argentina, Brazil, Ecuador?, French Guiana, Guyana, Venezuela (CABI CPC – not clear if some of these refer to <i>S. cosmioides</i> – Guyana and Venezuela refer to a publication on the Caribbean). <i>S. cosmioides</i>: Brazil (Zenker et al., 2007 & 2010; Santos et al., 2010). Both species are present in Brazil according to Silvie and Silvain (2004?).</p>
Climatic similarity	<p>Medium. 9 common climates considering the countries and areas listed above, but likely to be lower (as it may not occur to the extreme South of Argentina), also if <i>S. latifascia</i> and <i>S. cosmioides</i> are separate species.</p>
On which plants	<p><i>Spodoptera</i> species are highly polyphagous and, even if <i>S. latifascia</i> and <i>S. cosmioides</i> are separate species, it is not certain that their host range would be very different. The records below are as mentioned in the literature.</p> <p><i>S. latifascia</i>. Frequent on tomato and eggplant in the Antilles (Zagatti et al., 1995-2006). Tomato, beans, chili, sesame, maize, vegetables, also cotton (King and Saunders, 1984), citrus, capsicum, maize, cotton, tomato, tobacco (Silvain and Thiberville, 1984), many, incl. tomato, sweet pepper, carrot, etc. (CABI CPC),</p>

Damage	<p><i>S. cosmioides</i>: pineapple, cotton, rice, eggplant, onions, eucalyptus, pepper and tomato, among other vegetables, soybean (Bavaresco et al., 2004; Zaché et al., 2012); soybean, <i>Ricinus communis</i>, cotton (Pomari et al., 2012; Silvie and Silvain, 2004?).</p> <p><i>Spodoptera</i> have a similar biology (Heppner, 1998). Eggs are laid on leaves. Larvae feed on leaves, fruit and sometimes stems, generally at night. Pupae in soil. King and Saunders (1984) mentions a moderate to considerable importance on tomato, minor on others (applying presumably to <i>S. latifascia</i> as is related to Central America). <i>S. cosmioides</i> is considered as a pest in at least Brazil. <i>S. latifascia</i> is considered as one of the important species of <i>Spodoptera</i> in Cuba (with <i>S. eridania</i>, <i>S. albula</i> and <i>S. ornithogalli</i> (Ecured, ND).</p>
Dissemination Pathway	Adults fly. Heppner (2008) mention that <i>S. latifascia</i> migrates in summer within the USA. Fruit? plants for planting? of host plants and soil from countries where <i>S. latifascia</i> (or <i>S. cosmioides</i>) occurs.
Possible risks	Many hosts 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 medium-low. <i>S. latifascia</i> has a less tropical distribution than <i>S. albula</i> . The situation for <i>S. cosmioides</i> is not clear in the absence of clear data on its distribution in South America.
Categorization	<i>S. latifascia</i> : Quarantine pest for Japan 2011, Mozambique 2009 (from the IPP); <i>S. cosmioides</i> : none found.
Sources	<p>Bavaresco A, Garcia MS, Grützmaier AD, Ringenberg R, Foresti J. 2004. Adequação de uma dieta artificial para a criação de <i>Spodoptera cosmioides</i> (Walk.) (Lepidoptera: Noctuidae) em laboratório. Neotrop. Entomol. vol.33 no.2 Londrina Mar./Apr. 2004</p> <p>CABI CPC, 2013</p> <p>Dos Santos KB, Meneguim AM, dos Santos WJ, Neves PMOJ, dos Santos RB. 2010. Caracterização dos danos de <i>Spodoptera eridania</i> (Cramer) e <i>Spodoptera cosmioides</i> (Walker) (Lepidoptera: Noctuidae) a estruturas de algodoeiro. Neotrop. entomol. vol.39 no.4 Londrina July/Aug. 2010</p> <p>Ecured. ND. Mantequillas (<i>Spodoptera</i> spp.). http://www.ecured.cu/index.php/Spod%C3%B3pteras</p> <p>King ABS and Saunders JL. 1984. The invertebrate pests of annual food crops in Central America. Overseas Development Administration, London. http://books.google.dk/books?id=qMwOAAIAAJ&pg=PA149&lpg=PA149&dq=agrotis+repleta+king&source=bl&ots=xopGOSMmfD&sig=wjUkG49Wwcre-l9xl7AA6UImE4g&hl=en&sa=X&ei=eGP3Uc-yHunJOAX78oD4BQ&ved=0CDIQ6AEwAg#v=onepage&q=agrotis%20repleta%20king&f=false (Accessed January 2014)</p> <p>Lalanne-Cassou, B., J.F. Silvain, L. Monti, & C. Malosse. 1999. Mecanismos d'isolement reproducteur chez les especes du complexe neotropical <i>Spodoptera latifascia</i> <i>S. cosmioides</i> <i>S. descoinsi</i> (Lepidoptera: Noctuidae). Actes de la IV Conference Internationale Francophone d'Entomologie. Saint-Malo, France, 5-9 juillet, 1998. Ann. Soc. Entomol. Fr. 35: 109-116.</p> <p>Patterson B. ND. Checklist of the Lepidoptera of the Antilles. http://mothphotographersgroup.msstate.edu/Antilles/AntillesChecklist.shtml (Accessed January 2014)</p> <p>Pomari AF, De Freitas Bueno A, De Freitas Bueno RCO, De Oliveira Menezes Junior A. 2012. Biological Characteristics and Thermal Requirements of the Biological Control Agent <i>Telenomus remus</i> (Hymenoptera: Platygasteridae) Reared on Eggs of Different Species of the Genus <i>Spodoptera</i> (Lepidoptera: Noctuidae). Annals of the Entomological Society of America, 105(1):73-81. 2012.</p> <p>PQR</p> <p>Quarantine lists for Japan 2011, Mozambique 2009 (from the IPP)</p> <p>Santos GP, Cosenza GW, Albino JC. 1980. Biologia de <i>Spodoptera latifascia</i> (Walker, 1856) (Lepidoptera: Noctuidae) sobre folhas de eucalipto. Revista Brasileira de Entomologia 1980 Vol. 24 No. 2 pp. 153-155</p> <p>Silvain J-F, Lalanne-Cassou B. Distinction entre <i>Spodoptera latifascia</i> (Walker) et <i>Spodoptera cosmioides</i> (Walker), bona species (Lepidoptera, Noctuidae). Revue fr. Ent., v. 19, n. 3-4, p. 95-97,1997</p> <p>Silvain JF, Thiberville F. 1984. Les noctuelles (Lepidoptera: Noctuidae) nuisibles aux cultures industrielles et vivrieres en Guyane Francaise. 19th Annual meeting, Porto Rico, 1983 of the Caribbean Food Crops Society. Proceedings of the Caribbean Food Crops Society, 19, 217-30.</p> <p>Silvie P and Silvain JF. 2004?. <i>Spodoptera frugiperda</i> And Others Species Captured In Pheromone Traps In Cotton Cropping Systems (Mato Grosso State, Brazil). V Congresso brasileiro de algodao. http://www.cnpa.embrapa.br/produtos/algodao/publicacoes/trabalhos_cba5/138.pdf</p> <p>Zaché B, Wilcken CF, Rodrigues da Costa Zaché R, Medeiros de Souza N. 2012. Novo registro de <i>Trichospilus diatraeae</i> Cherian & Margabandhu, 1942 (Hymenoptera: Eulophidae), como parasitóide de <i>Spodoptera cosmioides</i> Walker, 1858 (Lepidoptera: Noctuidae) no Brasil. Biota Neotropica vol.12 no.1 Campinas Jan./Mar. 2012</p> <p>Zagatti P, Lalanne-Cassou B, le Duchat d'Aubigny J. 1995-2006. Catalogue of the lepidoptera of the French Antilles. INRA Database. http://www7.inra.fr/papillon/indexeng.htm (Accessed January 2014)</p>

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