

Eudocima fullonia (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.

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Africa	Asia	Oceania	North America	South-Central America and Caribbean
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Eudocima fullonia (*Othreis fullonia*) (Lepidoptera: Noctuidae) (fruit-piercing moth)

Why	Identified in the EPPO tomato study. Adults of <i>E. fullonia</i> cause damage to fruit of tomato and a large number of other species.
Where	<p>EPPO region: absent</p> <p>Africa: Angola, Benin, Cameroon, Congo, Congo Democratic Republic, Côte d'Ivoire, Ghana, Guinea, Kenya, Liberia, Madagascar, Malawi, Mozambique, Namibia, Nigeria, Réunion, Sao Tome and Principe, Sierra Leone, Tanzania, Uganda, Zimbabwe (CABI CPC); also Gabon, South Africa, Togo (Davis et al., 2005)</p> <p>Asia: Bhutan, Brunei Darussalam, China, Christmas Island (Indian Ocean), India, Indonesia, Japan (Honshu, Kyushu, Shikoku), Korea, DPR, Korea, Republic of, Laos, Malaysia, Mongolia (questionable according to Davis, 2005), Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, Vietnam (CABI CPC) Cambodia is also mentioned in the distribution in CABI CPC, but the pest is a quarantine pest for that country (QL for Cambodia, 2010 and this record is also not in PQR)</p> <p>North America: USA (Hawaii) (CABI CPC, Hawaii Edu, 2005)</p> <p>Oceania: American Samoa, Australia (New South Wales, Northern Territory, Queensland), Cook Islands, Fiji, French Polynesia, Guam, Micronesia, Federated states of, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Vanuatu, Wallis and Futuna Islands (CABI CPC), also Kiribati (Davis et al., 2005). New Zealand and Norfolk Island are listed in Davis et al. (2005), but the pest is considered as "absent no longer present" in PQR and CABI CPC (and recorded as migrant in both New Zealand and Norfolk Island in Moths of Borneo, 2013)</p>
Climatic similarity	Medium/high. 12 common climates considering the countries listed above, but possibly lower depending on where it occurs in the countries mentioned. Davis et al. (2005) considered it is associated with broadleaf and mixed forests, tropical and subtropical grasslands, savannas and shrubs, and tropical and subtropical moist broadleaf forests.
On which plants	<p>According to Davis et al. (2005), <i>E. fullonia</i> was recorded from over 100 plant species in over 34 families.</p> <p>Larvae feed on foliage of (mostly) wild hosts, most belonging to the families Menispermaceae and Fabaceae; example of larval hosts listed in Davis et al. (2005) are <i>Carronia</i>, <i>Erythrina</i>, <i>Cocculus</i>, <i>Fawcettia</i>, <i>Hypserpa</i>, <i>Stephania</i>, <i>Pleogyne</i>, <i>Tiliacora</i>, <i>Tinospora</i>, <i>Triclisia</i> as well as cocoa (<i>Theobroma cacao</i>). Larval hosts seem to vary with places; in the Pacific they belong mostly to <i>Erythrina</i> (Hawaii Edu, 2005). Some species have also been shown as larval hosts experimentally, of which <i>Diospyros australis</i> and <i>Malus domestica</i> (Davis et al., 2005). Tomato is not identified as a larval host.</p> <p>Adults feed on fruit of a wide range of plants, including crops such as citrus, apple, pear, stone fruit, grape, melon, tomato, mango, papaya, pineapple, strawberry, capsicum, eggplant. Davis et al. (2005) give a very long host list, which also includes <i>Cucumis</i>, <i>Rubus</i>, and CABI CPC (2013) also mentions <i>Actinidia chinensis</i>, <i>Diospyros kaki</i> (persimmon) and <i>Litchi chinensis</i> (lichi).</p>
Damage	Damage is caused by adult feeding on fruit. Feeding punctures affect the quality of the fruit and favour entry of pathogens and bacteria. Adults are reported to have a preference for ripe fruit, although other stages may be attacked (CABI CPC). CABI CPC (2013) mentions that fruit-piercing moth generally attack fruit too close to harvest for pesticides to be used. If damage is not detected at harvest or packing, healthy fruit may be contaminated by fermenting juices during transport. Primary damage of 50-70% by fruit-piercing moths on citrus in Thailand is reported, 95% of citrus and 100% of tomatoes in New Caledonia in outbreak years, entire crops of navel oranges during outbreaks in Queensland (Australia), 40-60% of citrus fruits damaged in China. Eggs and larvae are on larval hosts, and pupae on the host or on the ground.

Dissemination	Adults are strong fliers (Davis et al., 2005 citing others); they fly, feed and mate at night. <i>E. fullonia</i> may be transported as adult on fruit on which it feeds on, and as eggs and larvae (or pupae) on plants for planting of its larval hosts. Among these, a first rapid screening found only <i>Erythrina</i> sp. among plants imported into some countries of the EPPO region in 2010 (in data used for the EPPO study on plants for planting). Because adult fly and are nocturnal, the likelihood of association with consignments of fruit is questionable. Davis et al. (2005) mention only one interception of <i>Eudocima</i> in the USA (without mention of the type of commodity or life stage) (although noting some interceptions of Noctuidae, without identification at the genus level).
Pathway	Plants for planting of larval hosts and fruit (?) of adult hosts from countries where <i>E. fullonia</i> occurs
Possible risks	Many fruit crops attacked by adults of <i>E. fullonia</i> are major crops in the EPPO region. The climatic similarity, according to the EPPO Study, between the area where the pest occurs and the EPPO region is probably medium-high. For the pest to establish, it would need larval hosts, and there is an uncertainty on whether any of the larval hosts at origin occur in the EPPO region, or if the pest may use other hosts (such as <i>Malus domestica</i> , shown as larval host in the laboratory). <i>E. fullonia</i> is an important pest, although its probability of entry on fruit depends on highly mobile nocturnal adults. The pest is regulated in a large number of countries. It is not known on which pathways it has spread within its current distribution.
Categorization	Quarantine pest for Argentina 2011 (Citrus, tomato), Brazil 2010, Cambodia 2010, Costa Rica 2012, Mexico 2011, Paraguay 2010, Trinidad and Tobago 2010 (From IPP), New Zealand (Biosecurity NZ, 1998); Southern Africa A2 2001; Uruguay 1995 (from PQR)
Sources	<p>CABI CPC, 2013</p> <p>Biosecurity NZ. 1998. Import Health Standard Commodity Sub-class: Fresh Fruit/Vegetables Tomato, <i>Lycopersicon esculentum</i> from Tonga. Issued pursuant to Section 22 of the Biosecurity Act 1993. Date Issued: 14 December 1998</p> <p>Davis EE, French S, Venette RC. 2005. Mini Risk Assessment Fruit Piercing Moth: <i>Eudocima fullonia</i> Green [Lepidoptera: Noctuidae]. http://www.aphis.usda.gov/plant_health/plant_pest_info/pest_detection/downloads/prafulloniapra.pdf (Accessed December 2013)</p> <p>Ghana IPM. 1996. List of pests. http://ghana.ipm-info.org/list_insects.htm#Tomato (Accessed August 2013)</p> <p>Hawaii Edu. 2005. Database of pests and crops – tomato. http://www.extento.hawaii.edu/kbase/crop/crops/tomato.htm. (Accessed August 2013)</p> <p>Moths of Borneo. 2013. http://www.mothsofborneo.com (Accessed January 2014)</p> <p>PQR</p> <p>Quarantine lists of Argentina 2011, Brazil 2010, Cambodia 2010, Costa Rica 2012, Mexico 2011, Paraguay 2010, Trinidad and Tobago 2010 (from the IPP)</p> <p>USDA. 2009. Importation of Tomatoes, <i>Solanum lycopersicum</i>, from the Economic Community of West African States (ECOWAS) into the Continental United States. A Qualitative, Pathway-Initiated Pest Risk Assessment. June 5, 2009.</p>