

This short description was prepared in the framework of the EU FP7 project DROPSA - Strategies to develop effective, innovative and practical approaches to protect major European fruit crops from pests and pathogens (grant agreement no. 613678). This pest was listed in the DROPSA alert list for orange and mandarin, and *Vitis* fruit.

**Marmara gulosa (Lepidoptera: Gracillariidae)**

**Fruit pathway:** Yes, as eggs or larvae. On citrus, larvae mine in fruit rind (Stelinski and Rogers, 2013) On grapes, larvae form serpentine mines on the rachises and berries of table grapes and live in the fruit. The damage is often difficult to see (Grafton-Cardwell and Haviland 2013). Eggs are laid directly on the fruit, and when they hatch, the larvae tunnel within the rind of the fruit. The larvae pupate outside the mines in silken cocoons with small spheres on the exterior (Weeks *et al.* 2012). In grapes stems, petioles, tendril, bunch rachis and berries are affected (Eichlin and Kinnee 2001).

**Other pathways:** Plants for planting, cut flowers: eggs are on stems, larvae mine in stems and pupae are on twig, leaf or stem (Weeks *et al.* 2012; Stelinski and Rogers, 2013) Uncertain pathways: pods, nuts.

**Hosts:** Polyphagous, with hosts in 31 families (Stelinski 2011); originally a native pest of *Salix* and has shifted hosts to attack many non-native plants; hosts incl. *Citrus*, *Gossypium*, *Vigna unguiculata* (as cowpeas), *Solanum melongena*, *Vitis* (as grape), *Capsicum*, *Prunus domestica* (as plum), *Cucurbita* (as pumpkin, and zucchini), ornamentals, *Prunus armeniaca*, *Persea americana*, *Citrullus lanatus* (Stelinski and Rogers, 2013), *Malus domestica*, *Prunus avium*, *Gossypium hirsutum*, *Actinidia chinensis*, *Nerium oleander*, *Olea europaea*, *Prunus persica*, *Prunus salicina*, *Capsicum annum*, *Carica papaya*, *Juglans regia*, *Salix lasiolepis* (Guerrero *et al.*, 2012), *Phaseolus* (as beans), nuts, ornamentals (*Salix* and oleander), vegetables, weeds (UC IPM, 2013). *Citrus* is the main host in California (Eichlin and Kinnee 2001).

**Distribution:** North America: Mexico, USA (Arizona, California, Florida, and Texas); Mexico, Caribbean: Cuba (Guerrero *et al.*, 2012; Weeks *et al.* 2012).

**Damage:** Larvae of *Marmara gulosa* tunnel the rind of citrus fruit; damage is cosmetic but makes the fruit unmarketable for the fresh market (Guerrero *et al.*, 2012; Stelinski and Rogers, 2013). *Marmara gulosa* causes 5-80% damage on fruit in susceptible Citrus varieties, which are at higher risk if they are adjacent to crops in which populations build up (cotton and beans) (UC IPM, 2013). *Marmara gulosa* is economically important in California, Arizona, Northern Mexico and Cuba. In 1995, in California, one outbreak caused 80-90 % fruit loss in certain groves (Stelinski and Rogers, 2013). Damage on Citrus attributed to *Marmara salictella* in the 1980s-90s is now considered to have been due to *Marmara gulosa*. It was reported to prefer grapefruit to navel oranges, and navel oranges to lemons (Maurer *et al.*, 1998). No economic important damage to table grapes or raisins (Grafton-Cardwell and Haviland 2013);

**Other information:** In California, the pest was originally thought to be *M. salictella*, but was later described as *Marmara gulosa*; in addition citrus fruit in Mexico are attacked by a distinctly different and undescribed species of *Marmara* (Semet, 2010). *M. salictella* is recorded as a pest of citrus in some publications, but such records are thought to refer to *Marmara gulosa* (Gracilliridae.net, 2016). There is no overwintering stage; the insect continues development throughout the year, but the length of a generation is shorter during warm temperatures. There are 6-8 generations a year occurring at about monthly intervals from May to November (UC IPM 2008). Species identity was unclear till 2001 (Eichlin and Kinnee 2001). Proposed in answer to the EPPO questionnaire on pests of concern for *Vitis*.

<b>Recorded impact:</b> High	<b>Intercepted:</b> Not known	<b>Spreading/invasive:</b> Not known
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