EUROPEAN AND MEDITERRANEAN PLANT PROTECTION ORGANIZATION
ORGANISATION EUROPEENNE ET MEDITERRANEENNE POUR LA PROTECTION DES PLANTES

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Report of a Pest Risk Analysis for *Platynota stultana* (Lepidoptera: Tortricidae)

This summary presents the main features of a pest risk analysis which has been conducted on the pest, according to the EPPO Standard PM 5/5 *Decision-Support Scheme for an Express Pest Risk Analysis*. The full PRA record was prepared by the Spanish Ministry of Agriculture and Environment for the territory of the European Union. It was reviewed by the Panel on Phytosanitary Measures and considered as a valid basis to make recommendations for the entire EPPO region. This report presents the outcomes of the discussions in this Panel.

Pest: *Platynota stultana*, "omnivorous leafroller"
PRA area: EPPO region (based on the Spanish PRA for the EU)
Assessors: Ministerio de Agricultura, Alimentacion y Medio Ambiente
EPPO Secretariat and EPPO Panel on Phytosanitary Measures (to extend the PRA area to the EPPO region).

Date: 2016-05
The risk management part was reviewed by the EPPO Panel on Phytosanitary Measures on **2016-11 and 2017-03.**

STAGE 1: INITIATION

Reason for doing PRA: PRA initiated because of detections in the provinces of Almería (reported in February 2009), as well as in Murcia (Spain).

Taxonomic position of pest: Class: Insecta; Order: Lepidoptera; Family: Tortricidae; Genus: Platynota; Species: *Platynota stultana*

STAGE 2: PEST RISK ASSESSMENT

PROBABILITY OF INTRODUCTION

Entry

Geographical distribution:

North America:
USA (outdoors in Arizona, California, Florida, Hawaii, New Mexico; under greenhouses in Illinois, Massachusetts, Michigan, New York State, Pennsylvania), Mexico (Sonora, San Luis Potosí)

EPPO Region:
Spain (restricted distribution: outbreaks in greenhouses in Andalusia (Almeria), only trapped in Murcia, Alicante).

Major host plants:

As suggested by its name "omnivorous leafroller", *P. stultana* is highly polyphagous. Its potential range of food plants includes more than 20 plant families including relevant ornamental plants, agricultural crops, and even forest species (Powell & Brown, 2012) cited by (Groenen & Baixeras, 2013). A list of plants recorded as hosts in the literature is presented in Appendix 6 of the Spanish PRA. From that list the Spanish assessors have considered that those hosts that meet at least one of the following criteria:

- have *P. stultana* specifically included as a pest in the Integrated Pest Management Guidelines for its cultivation;
- are cited in literature as 'preferred', 'main' or 'primary' hosts of *P. stultana*;
- are cited by authoritative sources as crops where *P. stultana* has

caused losses, or where damage by *P. stultana* has been quantified or specifically described,

can be considered as preferred hosts and the PRA focused on these hosts.

The following hosts have been considered as preferred hosts:
Actinidia deliciosa (kiwifruit), ***Capsicum annuum*** L. (bell pepper), ***Citrus*** L**.,** ***Dianthus caryophyllus*** (carnation), ***Gossypium*** (cotton), ***Malus domestica***. (apple), ***Prunus domestica*** *(plum),* ***Prunus persica*** (peach), ***Punica granatum*** (pomegranate), ***Pyrus*** (pears), ***Rosa*** (roses), ***Rubus*** (blackberry, raspberry) and ***Vitis vinifera*** (grapevine).

It should be noted that *Medicago sativa* and *Zea mays* are recorded as main hosts in the CABI Crop Protection Compendium (accessed on 2017-03-06) reports of damage date back to 1957 and 1983 respectively and not further reports have been found. The Spanish assessors consequently decided not to consider these as preferred hosts.

In Spain, damage by *P. stultana* has exclusively been reported on *Capsicum annuum* L. (pepper). Nevertheless, there are anecdotal reports of ORL attacks on *Phaseolus vulgaris* L. (common bean), (October 28, 2011); *Solanum melongena* L. (aubergine), (May 26, 2010); *Cucumis sativus* L. (cucumber), (March 28, 2012); *Ocimum basilicum* L. (basil), used in greenhouses as reservoir for natural enemies (March 28, 2012); and *Atriplex halimus* L. (salado) indigenous flora, (May 12, 2011). *P.stultana* has not been detected again on these species and no further damage has been reported. The Spanish assessors consequently decided not to consider these `preferred host' in their PRA.

Which pathway(s) is the pest likely to be introduced on:

According to (CABI, 2014) *P. stultana* can be carried in trade as larvae in flowers, inflorescences, cones, calyx, fruits (incl. pods), and leaves, and as eggs or pupae in leaves. The following pathways have been identified:

- Plants for planting of 'preferred' and secondary hosts (except seeds, bulbs and tubers) with or without soil attached

P. stultana usually feeds on leaves, consequently plants that are not free from leaves and flowers may carry the pest.
Larvae move upwards toward the shoot tip and constructs a network of silken filaments ('ladder') on the surface of the host plant. After they have reached the second or sometimes even third instar, they feed while concealed in rolled or folded leaves. Pupation takes place in a silken cocoon, in a rolled leaf.
It should be noted that most of the preferred hosts (i.e. fruit tree species) are imported to most countries of the EPPO region in dormant stage or importation is prohibited. However, measures are recommended.
Secondary hosts present a lower risk: *Chrysanthemum* L. [=Dendranthema (DC.) Des Moul], *Convolvulus* L. (bindweed), [Convolvulaceae], *Cyclamen* L. (cyclamen) [Primulaceae], *Malva* L. (mallow), [Malvaceae], Pelargonium L'Hér.ex Aiton (geranium) [Geraniaceae]. Measures have been recommended for these species

- Fruits and vegetables of 'preferred' hosts

Larvae mostly feed externally on fruit (Yokohama et al., 1999). On *Capsicum* larvae also feed externally. Internal feeding has been reported for pomegranates, blackberries and raspberries and grapes (*Platynota* can complete its life cycle within the mummified bunches). There is uncertainty for kiwis as the publication referred to in the CABI Crop Compendium, Hasey et al. (2016) does not make mention of such behaviour.

The damage to citrus, pome and stone fruit is mostly external, and thus the likelihood of entry with these pathways is considered **lower**.

P. stultana has often been found in shipments of fruits and peppers from Mexico to the United States. (Bostanian et al., 2012).

Conclusion of the Spanish PRA
Consequently, those fruits which pose a higher risk of introduction since *P. stultana* can feed inside them (i.e.: mainly grapes, but also pomegranates, blackberries/raspberries and sweet peppers), do not have any regulations, except those posed for *Vitis* to Cyprus, and those posed against *Anthonomus eugenii* in peppers.

- Cut flowers and foliage of 'preferred' hosts

On *Dianthus caryophyllus* (carnation***)***, leaf-tying, bud boring and stem boring in descending order of frequency is noted (Bohart, 1942)
On *Rosa* (***rose)***, larvae draw two leaves together, or fold over the edges of individual leaves, usually severing the petioles of the leaflet and causing it to die. Some feeding takes place on the inner side of the folded leaf; also flower buds are sometimes eaten into on the side and tender growths are cut off. (United States: Bureau of Ent.,1933).
Other preferred hosts are not traded as cut flowers or foliage.

- Packaging material in consignments

This covers crates or boxes used for packing host plants. Packaging carrying fruit is not mentioned in the literature as a possible pathway for this pest, but it is considered to be a pathway of *Tuta absoluta* within the EPPO region (Potting et al., 2010) and is also considered for *P. stultana*.
The life stage which could most likely be associated with packaging is pupae. Pupae are normally formed in leaves. However, emerging mature larvae transforming to pupae in packing material may pupate at the surface of the crate or between fruits. It is not known whether packing material such as crates would be subjected to any management measures. Packaging used to carry host products may be used for other products while still carrying life stages of the pest. The pest would be even more likely to remain undetected than on fruit, as inspection (if any) would mostly target the commodity itself.

- Natural spread from areas where the pest is present.

Although *P. stultana* can fly for several miles (UC-IPM, 2014) (1 mile =1.6093km), and there is a wide range of hosts (including wild hosts) that are widely distributed within the EU, *P. stultana* has spread only locally in Spain and reasonably isolated from outdoors crops due to the distance and the use of phytosanitary treatments against Lepidoptera which prevent the increase of population.

Other pathways considered unlikely
Soil and growing media (larvae are usually in leaves although they can be present on soil).

Pathway considered but not retained
Travelers carrying fruits or plants for planting of hosts
Regular inspections of travelers or their luggage are not carried out in the EU. Entry on fruit transported by travelers is unlikely as such fruit are likely to be intended for consumption, which limits the possibilities for transfer of the pest to a host. Transport of plants for planting with travelers is possible.
Taking measures on this pathway would require a general approach for plants and plant products carried by travellers, including raising awareness

and carrying out inspection (EPPO, 2012). The assessors considered that this is beyond the scope of a PRA.

Establishment

Plants or habitats at risk in the PRA area:

Host plants are present throughout the EPPO region.

Climatic similarity of present distribution with PRA area (or parts thereof):

Establishment outdoors in the PRA area could be limited by climatic conditions.

Southern Europe and Mediterranean Basin: In Spain very low captures have been recorded in the provinces of Almería and Murcia for several years. Therefore, it seems that the pest can establish outdoors in the Southern area.

Northern Europe:

P. stultana is quiescent (**not diapausing**) during the colder winter months and **unable to survive prolonged periods of frost**. This condition limits its range in North America and most likely can result in significant mortality in those areas where periodic winter freezes occur (Bostanian et al, 2012).

P. stultana has been reported attacking roses in greenhouses in the North-eastern United States but its presence outdoors has never been recorded. It can be assumed that the same situation may occur **in Northern Europe, hampering its establishment outdoors.**

However transient populations in summer could occur.

Characteristics (other than climatic) of the PRA area that would favour establishment:

According to the observation in Spain, levels of population remain very low but the reasons are not clear.

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Which part of the PRA area is the area of potential establishment:

Mediterranean basin and Portugal, as well as hosts under protected cultivation in the rest of the EPPO region.

POTENTIAL ECONOMIC CONSEQUENCES

How much economic impact does the pest have in its present distribution:

High in Mexico and Southern USA: it is an important pest of agricultural, and ornamental plants, causing billions of dollars in damage annually.

Low in Spain. Existing control measures against other lepidopteran in those crops where *P. stultana* has been detected may play a role in its control as, in some cases, the management strategy to control these other lepidopterans is similar to the strategy followed by other countries, as USA, against *P. stultana*. Nevertheless, organic crops have not been affected either.

Describe damage to potential hosts in PRA area:

P. stultana is a pest that usually feeds on leaves. Feeding on fruits results in scaring and pitting that is mostly cosmetic.

On *Vitis vinifera (*grapes), larvae feed on leaves, flowers and developing berries, but the primary problem is that it allows rot organisms to enter fruit at the sites where it feeds. This is also noted for pomegranates.

How much economic impact would the pest have in the PRA area:

Theoretically, damage could be as high as in the area of origin where the climate is similar (e.g. Mediterranean climate), and the same number of generations occurs. However, no relevant damage has been reported in Spain. It is considered that current phytosanitary measures carried out in the greenhouses against *Spodoptera exigua* and other Lepidoptera, especially during the summer when most pepper production cycle is starting in Almeria, are hampering the establishment of this species. Nevertheless, organic crops have not been affected either.

The Spanish PRA considers that damage may however be higher in areas where no IPM is applied against Lepidopteran pests.
Climate in the South of the Mediterranean Basin and the Near East is warmer and may allow a larger number of generations to develop.

CONCLUSIONS OF PEST RISK ASSESSMENT
Summarize the major factors that influence the acceptability of the risk from this pest:

Estimate the probability of entry:	High with host plants for planting and Vitis fruit from USA and Mexico. Medium with fresh fruits of kiwis, pomegranates, blackberries / raspberries; and fruits of vegetables: sweet peppers from USA and Mexico. It is considered that the risk of entry with commodities from Spain is medium. Although a very low pest prevalence in crops has been noted, infested consignments have been detected in the Netherlands.
Estimate the probability of establishment:	Likelihood of establishment outdoors in the Mediterranean basin and Portugal would be high, whereas it would be low in northern Europe (with low uncertainty). Indoor, the probability of establishment is high in the entire PRA area (with low uncertainty if no control measures are applied).
Estimate the probability of spread:	Moderate for human assisted spread, Low under current conditions for natural spread from Spain
Estimate the potential economic impact:	**High (with high uncertainty)**
Endangered area (evaluation made by the EPPO Secretariat)	Outdoors Mediterranean basin and Portugal Indoor: entire EPPO region (however see uncertainty on the potential economic impact)
Degree of uncertainty	The main uncertainty is the potential impact in the PRA area. It is not known why the pest does not affect crops in Spain as it does in its native range. Other uncertainties are: • Biology of the pest: upper development temperature, number of generations in the Mediterranean Basin. • Changes in physiological tolerance to greatly expand its geographical and ecological range. • Inability to survive prolonged periods of freezing • Pathway of introduction in Northern States of the USA. • Detailed data on trade of ornamental plants have not been found. • Presence of the pest in other countries but still not detected. • Although it does not seem probably, it is not really known if the pest would be able to withstand cold winters. • Conflicting information on its capacity to tunnel in fruits • Host status needs clarification for *Medicago sativa* (alfalfa) and *Zea mays* (maize).
OVERALL CONCLUSIONS	Potential consequences of the organism for cultivated host plants are high with a medium uncertainty.

STAGE 3: PEST RISK MANAGEMENT

IDENTIFICATION OF THE PATHWAYS

Pathways studied in the pest risk management

- Plants for planting of 'preferred' and secondary hosts (except seeds, bulbs and tubers) with or without soil attached"
- Fruits and vegetables of preferred hosts.
- Cut flowers of *Dianthus, Rose* and *Chrysanthemum*

Comment
The probability of entry with host plants and plant products from Spain is considered unlikely so for this origin measures could be less stringent; However, it would be important that further information is provided by the Spanish NPPO.

IDENTIFICATION OF POSSIBLE MEASURES

Possible measures for pathways: see detailed evaluation in the Spanish PRA. The EPPO Panel on Phytosanitary Measures considered the evaluation of measures made in the Spanish PRA and recommended the measures below.

EVALUATION OF THE MEASURES IDENTIFIED IN RELATION TO THE RISKS PRESENTED BY THE PATHWAYS

Degree of uncertainty Possibility to detect early infestation, efficacy of treatments for fruit other than grapes

IDENTIFICATION OF POSSIBLE MEASURES

PC= Phytosanitary certificate

Pathways	- Measures
Plants for planting (except seed) of ***preferred hosts:*** ***Actinidia deliciosa*** *(*kiwifruit), ***Capsicum annuum*** L. (bell pepper), ***Citrus*** L.**,** ***Dianthus caryophyllus*** (carnation), ***Gossypium*** (cotton), ***Malus domestica*** (apple), ***Prunus domestica*** *(plum),* ***Prunus persica*** (peach), ***Punica granatum*** (pomegranate), ***Pyrus*** (pears), ***Rosa*** (roses), ***Rubus*** (blackberry, raspberry) and ***Vitis vinifera*** (grapevine).	PC and • Pest-free area or • When possible, grown under complete physical isolation (EPPO Standard PM 5/8) and packaging to prevent infestation during transport or • Dormant plants without fruit and leaves or • In vitro plants
Fruits: pomegranates, blackberries and raspberries, grapes and sweet peppers	PC and • Pest-free area or • When possible, grown under complete physical isolation (EPPO Standard PM 5/8) or • Systems approach: monitoring + treatments of the crop + removal of leaves and green parts
Fruits of citrus, apples, plums, peaches, pears	PC and Without leaves and green parts
Cut flowers of *Dianthus, Rose* and *Chrysanthemum*	PC and • Pest-free area or • Grown under complete physical protection (EPPO Standard PM 5/8)

References

Ministerio de Agricultura, Alimentation y Medio ambiente, 2014. Pest Risk Analysis for *Platynota stultana*