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Pest categorisation of *Oligonychus perditus*

EFSA Panel on Plant Health (PLH),

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Abstract

The Panel on Plant Health performed a pest categorisation of the spider mite *Oligonychus perditus* Pritchard and Baker (1955) (Acari, Tetranychidae), for the EU. *O. perditus* is a well-defined and distinguishable species, native to China, Japan, Korea and Taiwan, and recognised mainly as a pest of *Juniperus* spp., *Chamaecyparis* spp. and *Platycladus* spp. It is absent from the EU and is listed in Annex IIAI of Directive 2000/29/EC. Its host plants, *Juniperus* spp. and *Chamaecyparis* spp., are also listed in Annex III of Directive 2000/29/EC. Plants for planting, cut flowers and branches are considered as pathways for this pest, which is also able to disperse naturally with the wind, over rather short distances. *O. perditus* has repeatedly been intercepted in the EU but does not appear to have established, although a small population of *O. perditus* survived 8 years on a single imported plant in the Netherlands. As the host range of *O. perditus* coincides with that of the closely related cosmopolitan *Oligonychus ununguis*, which occurs in the EU, it is quite likely that the presence of *O. perditus* in the EU would cause little additional damage. Cultural control (sanitation and destruction of infested material) and chemical control (acaricides, e.g. abamectin) are the major control methods. All criteria assessed by EFSA for consideration as a potential quarantine pest are met, though there are some uncertainties regarding impacts. The species is presently absent from the EU, and thus, the criteria for consideration as a potential regulated non-quarantine pest are not met.

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1. Introduction

1.1. Background and Terms of Reference as provided by the requestor

1.1.1. Background

Council Directive 2000/29/EC¹ on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community establishes the present European Union plant health regime. The Directive lays down the phytosanitary provisions and the control checks to be carried out at the place of origin on plants and plant products destined for the Union or to be moved within the Union. In the Directive's 2000/29/EC annexes, the list of harmful organisms (pests) whose introduction into or spread within the Union is prohibited, is detailed together with specific requirements for import or internal movement.

Following the evaluation of the plant health regime, the new basic plant health law, Regulation (EU) 2016/2031² on protective measures against pests of plants, was adopted on 26 October 2016 and will apply from 14 December 2019 onwards, repealing Directive 2000/29/EC. In line with the principles of the above mentioned legislation and the follow-up work of the secondary legislation for the listing of EU regulated pests, EFSA is requested to provide pest categorizations of the harmful organisms included in the annexes of Directive 2000/29/EC, in the cases where recent pest risk assessment/ pest categorisation is not available.

1.1.2. Terms of Reference

EFSA is requested, pursuant to Article 22(5.b) and Article 29(1) of Regulation (EC) No 178/2002³, to provide scientific opinion in the field of plant health.

EFSA is requested to prepare and deliver a pest categorisation (step 1 analysis) for each of the regulated pests included in the appendices of the annex to this mandate. The methodology and template of pest categorisation have already been developed in past mandates for the organisms listed in Annex II Part A Section II of Directive 2000/29/EC. The same methodology and outcome is expected for this work as well.

The list of the harmful organisms included in the annex to this mandate comprises 133 harmful organisms or groups. A pest categorisation is expected for these 133 pests or groups and the delivery of the work would be stepwise at regular intervals through the year as detailed below. First priority covers the harmful organisms included in Appendix 1, comprising pests from Annex II Part A Section I and Annex II Part B of Directive 2000/29/EC. The delivery of all pest categorisations for the pests included in Appendix 1 is June 2018. The second priority is the pests included in Appendix 2, comprising the group of *Cicadellidae* (non-EU) known to be vector of Pierce's disease (caused by *Xylella fastidiosa*), the group of *Tephritidae* (non-EU), the group of potato viruses and virus-like organisms, the group of viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. and the group of *Margarodes* (non-EU species). The delivery of all pest categorisations for the pests included in Appendix 2 is end 2019. The pests included in Appendix 3 cover pests of Annex I part A section I and all pests categorisations should be delivered by end 2020.

For the above mentioned groups, each covering a large number of pests, the pest categorisation will be performed for the group and not the individual harmful organisms listed under "such as" notation in the Annexes of the Directive 2000/29/EC. The criteria to be taken particularly under consideration for these cases, is the analysis of host pest combination, investigation of pathways, the damages occurring and the relevant impact.

Finally, as indicated in the text above, all references to 'non-European' should be avoided and replaced by 'non-EU' and refer to all territories with exception of the Union territories as defined in Article 1 point 3 of Regulation (EU) 2016/2031.

¹ Council Directive 2000/29/EC of 8 May 2000 on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community. OJ L 169/1, 10.7.2000, p. 1–112.

² Regulation (EU) 2016/2031 of the European Parliament of the Council of 26 October 2016 on protective measures against pests of plants. OJ L 317, 23.11.2016, p. 4–104.

³ Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. OJ L 31/1, 1.2.2002, p. 1–24.

1.1.2.1. Terms of Reference: Appendix 1

List of harmful organisms for which pest categorisation is requested. The list below follows the annexes of Directive 2000/29/EC.

Annex IIAI

(a) Insects, mites and nematodes, at all stages of their development

<i>Aleurocantus</i> spp.	<i>Numonia pyrivorella</i> (Matsumura)
<i>Anthonomus bisignifer</i> (Schenkling)	<i>Oligonychus perditus</i> Pritchard and Baker
<i>Anthonomus signatus</i> (Say)	<i>Pissodes</i> spp. (non-EU)
<i>Aschistonyx eppoi</i> Inouye	<i>Scirtothrips aurantii</i> Faure
<i>Carposina niponensis</i> Walsingham	<i>Scirtothrips citri</i> (Moultex)
<i>Enarmonia packardi</i> (Zeller)	<i>Scolytidae</i> spp. (non-EU)
<i>Enarmonia prunivora</i> Walsh	<i>Scrobipalopsis solanivora</i> Povolny
<i>Grapholita inopinata</i> Heinrich	<i>Tachypterellus quadrigibbus</i> Say
<i>Hishomonus phycitis</i>	<i>Toxoptera citricida</i> Kirk.
<i>Leucaspis japonica</i> Ckll.	<i>Unaspis citri</i> Comstock
<i>Listronotus bonariensis</i> (Kuschel)	

(b) Bacteria

Citrus variegated chlorosis	<i>Xanthomonas campestris</i> pv. <i>oryzae</i> (Ishiyama)
<i>Erwinia stewartii</i> (Smith) Dye	Dye and pv. <i>oryzicola</i> (Fang, et al.) Dye

(c) Fungi

<i>Alternaria alternata</i> (Fr.) Keissler (non-EU pathogenic isolates)	<i>Elsinoe</i> spp. Bitanc. and Jenk. Mendes
<i>Anisogramma anomala</i> (Peck) E. Müller	<i>Fusarium oxysporum</i> f. sp. <i>albedinis</i> (Kilian and Maire) Gordon
<i>Apiosporina morbosa</i> (Schwein.) v. Arx	<i>Guignardia piricola</i> (Nosa) Yamamoto
<i>Ceratocystis virescens</i> (Davidson) Moreau	<i>Puccinia pittieriana</i> Hennings
<i>Cercoseptoria pini-densiflorae</i> (Hori and Nambu) Deighton	<i>Stegophora ulmea</i> (Schweinitz: Fries) Sydow & Sydow
<i>Cercospora angolensis</i> Carv. and Mendes	<i>Venturia nashicola</i> Tanaka and Yamamoto

(d) Virus and virus-like organisms

Beet curly top virus (non-EU isolates)	Little cherry pathogen (non- EU isolates)
Black raspberry latent virus	Naturally spreading psorosis
Blight and blight-like	Palm lethal yellowing mycoplasma
Cadang-Cadang viroid	Satsuma dwarf virus
Citrus tristeza virus (non-EU isolates)	Tatter leaf virus
Leprosis	Witches' broom (MLO)

Annex IIB

(a) Insect mites and nematodes, at all stages of their development

<i>Anthonomus grandis</i> (Boh.)	<i>Ips cembrae</i> Heer
<i>Cephalcia lariciphila</i> (Klug)	<i>Ips duplicatus</i> Sahlberg
<i>Dendroctonus micans</i> Kugelan	<i>Ips sexdentatus</i> Börner
<i>Gilpinia hercyniae</i> (Hartig)	<i>Ips typographus</i> Heer
<i>Gonipterus scutellatus</i> Gyll.	<i>Sternochetus mangiferae</i> Fabricius
<i>Ips amitinus</i> Eichhof	

(b) Bacteria

Curtobacterium flaccumfaciens pv. *flaccumfaciens*
(Hedges) Collins and Jones

(c) Fungi

Glomerella gossypii Edgerton

Hypoxyton mammatum (Wahl.) J. Miller

Gremmeniella abietina (Lag.) Morelet

1.1.2.2. Terms of Reference: Appendix 2

List of harmful organisms for which pest categorisation is requested per group. The list below follows the categorisation included in the annexes of Directive 2000/29/EC.

Annex IAI**(a) Insects, mites and nematodes, at all stages of their development**

Group of Cicadellidae (non-EU) known to be vector of Pierce's disease (caused by *Xylella fastidiosa*), such as:

- | | |
|--|---|
| 1) <i>Carneocephala fulgida</i> Nottingham | 3) <i>Graphocephala atropunctata</i> (Signoret) |
| 2) <i>Draeculacephala minerva</i> Ball | |

Group of Tephritidae (non-EU) such as:

- | | |
|--|---|
| 1) <i>Anastrepha fraterculus</i> (Wiedemann) | 12) <i>Pardalaspis cyanescens</i> Bezzi |
| 2) <i>Anastrepha ludens</i> (Loew) | 13) <i>Pardalaspis quinaria</i> Bezzi |
| 3) <i>Anastrepha obliqua</i> Macquart | 14) <i>Pterandrus rosa</i> (Karsch) |
| 4) <i>Anastrepha suspensa</i> (Loew) | 15) <i>Rhacochlaena japonica</i> Ito |
| 5) <i>Dacus ciliatus</i> Loew | 16) <i>Rhagoletis completa</i> Cresson |
| 6) <i>Dacus curcurbitae</i> Coquillett | 17) <i>Rhagoletis fausta</i> (Osten-Sacken) |
| 7) <i>Dacus dorsalis</i> Hendel | 18) <i>Rhagoletis indifferens</i> Curran |
| 8) <i>Dacus tryoni</i> (Froggatt) | 19) <i>Rhagoletis mendax</i> Curran |
| 9) <i>Dacus tsuneonis</i> Miyake | 20) <i>Rhagoletis pomonella</i> Walsh |
| 10) <i>Dacus zonatus</i> Saund. | 21) <i>Rhagoletis suavis</i> (Loew) |
| 11) <i>Epochra canadensis</i> (Loew) | |

(c) Viruses and virus-like organisms

Group of potato viruses and virus-like organisms such as:

- | | |
|----------------------------------|--|
| 1) Andean potato latent virus | 4) Potato black ringspot virus |
| 2) Andean potato mottle virus | 5) Potato virus T |
| 3) Arracacha virus B, oca strain | 6) non-EU isolates of potato viruses A, M, S, V, X and Y (including Yo, Yn and Yc) and Potato leafroll virus |

Group of viruses and virus-like organisms of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L., such as:

- | | |
|--------------------------------------|--|
| 1) Blueberry leaf mottle virus | 8) Peach yellows mycoplasma |
| 2) Cherry rasp leaf virus (American) | 9) Plum line pattern virus (American) |
| 3) Peach mosaic virus (American) | 10) Raspberry leaf curl virus (American) |
| 4) Peach phony rickettsia | 11) Strawberry witches' broom mycoplasma |
| 5) Peach rosette mosaic virus | 12) Non-EU viruses and virus-like organisms of <i>Cydonia</i> Mill., <i>Fragaria</i> L., <i>Malus</i> Mill., <i>Prunus</i> L., <i>Pyrus</i> L., <i>Ribes</i> L., <i>Rubus</i> L. and <i>Vitis</i> L. |
| 6) Peach rosette mosaic virus | |
| 7) Peach X-disease mycoplasma | |

Annex IIAI

(a) Insects, mites and nematodes, at all stages of their development

Group of *Margarodes* (non-EU species) such as:

- 1) *Margarodes vitis* (Phillipi)
- 2) *Margarodes vredendalensis* de Klerk
- 3) *Margarodes prieskaensis* Jakubski

1.1.2.3. Terms of Reference: Appendix 3

List of harmful organisms for which pest categorisation is requested. The list below follows the annexes of Directive 2000/29/EC.

Annex IAI

(a) Insects, mites and nematodes, at all stages of their development

<i>Acleris</i> spp. (non-EU)	<i>Longidorus diadecturus</i> Eveleigh and Allen
<i>Amauromyza maculosa</i> (Malloch)	<i>Monochamus</i> spp. (non-EU)
<i>Anomala orientalis</i> Waterhouse	<i>Myndus crudus</i> Van Duzee
<i>Arrhenodes minutus</i> Drury	<i>Nacobbus aberrans</i> (Thorne) Thorne and Allen
<i>Choristoneura</i> spp. (non-EU)	<i>Naupactus leucoloma</i> Boheman
<i>Conotrachelus nenuphar</i> (Herbst)	<i>Premnotrypes</i> spp. (non-EU)
<i>Dendrolimus sibiricus</i> Tschetverikov	<i>Pseudopityophthorus minutissimus</i> (Zimmermann)
<i>Diabrotica barberi</i> Smith and Lawrence	<i>Pseudopityophthorus pruinus</i> (Eichhoff)
<i>Diabrotica undecimpunctata howardi</i> Barber	<i>Scaphoideus luteolus</i> (Van Duzee)
<i>Diabrotica undecimpunctata undecimpunctata</i> Mannerheim	<i>Spodoptera eridania</i> (Cramer)
<i>Diabrotica virgifera zea</i> Krysan & Smith	<i>Spodoptera frugiperda</i> (Smith)
<i>Diaphorina citri</i> Kuway	<i>Spodoptera litura</i> (Fabricus)
<i>Heliothis zea</i> (Boddie)	<i>Thrips palmi</i> Karny
<i>Hirschmanniella</i> spp., other than <i>Hirschmanniella</i> <i>gracilis</i> (de Man) Luc and Goodey	<i>Xiphinema americanum</i> Cobb sensu lato (non-EU populations)
<i>Liriomyza sativae</i> Blanchard	<i>Xiphinema californicum</i> Lamberti and Bleve-Zacheo

(b) Fungi

<i>Ceratocystis fagacearum</i> (Bretz) Hunt	<i>Mycosphaerella larici-leptolepis</i> Ito et al.
<i>Chrysomyxa arctostaphyli</i> Dietel	<i>Mycosphaerella populorum</i> G. E. Thompson
<i>Cronartium</i> spp. (non-EU)	<i>Phoma andina</i> Turkensteen
<i>Endocronartium</i> spp. (non-EU)	<i>Phyllosticta solitaria</i> Ell. and Ev.
<i>Guignardia laricina</i> (Saw.) Yamamoto and Ito	<i>Septoria lycopersici</i> Speg. var. <i>malagutii</i> Ciccarone and Boerema
<i>Gymnosporangium</i> spp. (non-EU)	<i>Thecaphora solani</i> Barrus
<i>Inonotus weirii</i> (Murril) Kotlaba and Pouzar	<i>Trechispora brinkmannii</i> (Bresad.) Rogers
<i>Melampsora farlowii</i> (Arthur) Davis	

(c) Viruses and virus-like organisms

Tobacco ringspot virus	Pepper mild tigré virus
Tomato ringspot virus	Squash leaf curl virus
Bean golden mosaic virus	Euphorbia mosaic virus
Cowpea mild mottle virus	Florida tomato virus
Lettuce infectious yellows virus	

(d) Parasitic plants

Arceuthobium spp. (non-EU)

Annex I A I I

(a) Insects, mites and nematodes, at all stages of their development

Meloidogyne fallax Karssen

Rhizoecus hibisci Kawai and Takagi

Popillia japonica Newman

(b) Bacteria

Clavibacter michiganensis (Smith) Davis et al.
ssp. *sepedonicus* (Spieckermann and Kotthoff)
Davis et al.

Ralstonia solanacearum (Smith)
Yabuuchi et al.

(c) Fungi

Melampsora medusae Thümen

Synchytrium endobioticum (Schilbersky) Percival

Annex I B

(a) Insects, mites and nematodes, at all stages of their development

Leptinotarsa decemlineata Say

Liriomyza bryoniae (Kaltenbac)

(b) Viruses and virus-like organisms

Beet necrotic yellow vein virus

1.2. Interpretation of the Terms of Reference

Oligonychus perditus is one of a number of pests listed in the Appendices to the Terms of Reference (ToR) to be subject to pest categorisation to determine whether it fulfils the criteria of a quarantine pest or those of a regulated non-quarantine pest for the area of the EU excluding Ceuta, Melilla and the outermost regions of Member States (MSs) referred to in Article 355(1) of the Treaty on the Functioning of the European Union (TFEU), other than Madeira and the Azores.

2. Data and methodologies

2.1. Data

2.1.1. Literature search

A literature search on *O. perditus* was conducted at the beginning of the categorisation in the ISI Web of Science bibliographic database, using the scientific name of the pest as search term. Relevant papers were reviewed and further references and information were obtained from experts, from citations within the references and grey literature.

The Department for Environment Food and Rural Affairs (DEFRA, 2015), published a rapid pest risk analysis for *O. perditus* for the UK territory. Following this analysis, no additional information has been published. Therefore, this recent assessment is still current and cited in the present opinion, but the scope is widened to the whole EU territory. Excerpts from the UK assessment have been indicated in italics between quotation marks to allow for their easy identification.

2.1.2. Database search

Pest information, on the host(s) and distribution, was retrieved from the European and Mediterranean Plant Protection Organization (EPPO) Global Database (EPPO, 2017) and the Crop Protection Compendium (CABI).

The Europhyt database was consulted for pest-specific notifications on interceptions and outbreaks. Europhyt is a web-based network launched by the Directorate General for Health and Consumers (DG

SANCO) and is a subproject of PHYSAN (Phyto-Sanitary Controls) specifically concerned with plant health information. The Europhyt database manages notifications of interceptions of plants or plant products that do not comply with EU legislation as well as notifications of plant pests detected in the territory of the MSs and the phytosanitary measures taken to eradicate or avoid their spread.

2.2. Methodologies

The Panel performed the pest categorisation for *O. perditus*, following guiding principles and steps presented in the EFSA guidance on the harmonised framework for pest risk assessment (EFSA PLH Panel, 2010) and as defined in the International Standard for Phytosanitary Measures No 11 (FAO, 2013) and No 21 (FAO, 2004).

In accordance with the guidance on a harmonised framework for pest risk assessment in the EU (EFSA PLH Panel, 2010), this work was initiated following an evaluation of the EU’s plant health regime. Therefore, to facilitate the decision-making process, in the conclusions of the pest categorisation, the Panel addresses explicitly each criterion for a Union quarantine pest and for a Union regulated non-quarantine pest in accordance with Regulation (EU) 2016/2031 on protective measures against pests of plants, and includes additional information required as per the specific ToR received by the European Commission. In addition, for each conclusion, the Panel provides a short description of its associated uncertainty.

Table 1 presents the Regulation (EU) 2016/2031 pest categorisation criteria on which the Panel bases its conclusions. All relevant criteria have to be met for the pest to potentially qualify either as a quarantine pest or as a regulated non-quarantine pest. If one of the criteria is not met, the pest will not qualify. A pest that does not qualify as a quarantine pest may still qualify as a regulated non-quarantine pest which needs to be addressed in the opinion. For the pests regulated in the protected zones only, the scope of the categorisation is the territory of the protected zone; thus, the criteria refer to the protected zone instead of the EU territory.

It should be noted that the Panel’s conclusions are formulated respecting its remit and particularly with regard to the principle of separation between risk assessment and risk management (EFSA founding regulation (EU) No 178/2002); therefore, instead of determining whether the pest is likely to have an unacceptable impact, the Panel will present a summary of the observed pest impacts. Economic impacts are expressed in terms of yield and quality losses and not in monetary terms, while addressing social impacts is outside the remit of the Panel, in agreement with EFSA guidance on a harmonised framework for pest risk assessment (EFSA PLH Panel, 2010).

Table 1: Pest categorisation criteria under evaluation, as defined in Regulation (EU) 2016/2031 on protective measures against pests of plants (the number of the relevant sections of the pest categorisation is shown in brackets in the first column)

Criterion of pest categorisation	Criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Criterion in Regulation (EU) 2016/2031 regarding protected zone quarantine pest (articles 32–35)	Criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest
Identity of the pest (Section 3.1)	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?	Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?
Absence/presence of the pest in the EU territory (Section 3.2)	Is the pest present in the EU territory? If present, is the pest widely distributed within the EU? Describe the pest distribution briefly!	Is the pest present in the EU territory? If not, it cannot be a protected zone quarantine organism.	Is the pest present in the EU territory? If not, it cannot be a regulated non-quarantine pest. (A regulated non-quarantine pest must be present in the risk assessment area).

Criterion of pest categorisation	Criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Criterion in Regulation (EU) 2016/2031 regarding protected zone quarantine pest (articles 32–35)	Criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest
Regulatory status (Section 3.3)	If the pest is present in the EU but not widely distributed in the risk assessment area, it should be under official control or expected to be under official control in the near future.	The protected zone system aligns with the pest-free area system under the International Plant Protection Convention (IPPC). The pest satisfies the IPPC definition of a quarantine pest that is not present in the risk assessment area (i.e. protected zone).	Is the pest regulated as a quarantine pest? If currently regulated as a quarantine pest, are there grounds to consider its status could be revoked?
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	Is the pest able to enter into, become established in, and spread within, the EU territory? If yes, briefly list the pathways!	Is the pest able to enter into, become established in, and spread within, the protected zone areas? Is entry by natural spread from EU areas where the pest is present possible?	Is spread mainly via specific plants for planting, rather than via natural spread or via movement of plant products or other objects? Clearly state if plants for planting is the main pathway!
Potential for consequences in the EU territory (Section 3.5)	Would the pests' introduction have an economic or environmental impact on the EU territory?	Would the pests' introduction have an economic or environmental impact on the protected zone areas?	Does the presence of the pest on plants for planting have an economic impact, as regards the intended use of those plants for planting?
Available measures (Section 3.6)	Are there measures available to prevent the entry into, establishment within or spread of the pest within the EU such that the risk becomes mitigated?	Are there measures available to prevent the entry into, establishment within or spread of the pest within the protected zone areas such that the risk becomes mitigated? Is it possible to eradicate the pest in a restricted area within 24 months (or a period longer than 24 months where the biology of the organism so justifies) after the presence of the pest was confirmed in the protected zone?	Are there measures available to prevent pest presence on plants for planting such that the risk becomes mitigated?
Conclusion of pest categorisation (Section 4)	A statement as to whether (1) all criteria assessed by EFSA above for consideration as a potential quarantine pest were met and (2) if not, which one(s) were not met.	A statement as to whether (1) all criteria assessed by EFSA above for consideration as potential protected zone quarantine pest were met, and (2) if not, which one(s) were not met.	A statement as to whether (1) all criteria assessed by EFSA above for consideration as a potential regulated non-quarantine pest were met, and (2) if not, which one(s) were not met.

The Panel will not indicate in its conclusions of the pest categorisation whether to continue the risk assessment process, but, following the agreed two-step approach, will continue only if requested by the risk managers. However, during the categorisation process, experts may identify key elements and knowledge gaps that could contribute significant uncertainty to a future assessment of risk. It would

be useful to identify and highlight such gaps so that potential future requests can specifically target the major elements of uncertainty, perhaps suggesting specific scenarios to examine.

3. Pest categorisation

3.1. Identity and biology of the pest

3.1.1. Identity and taxonomy

Is the identity of the pest established, or has it been shown to produce consistent symptoms and to be transmissible?

Yes, the identity of *Oligonychus perditus* is well established. It can be identified to the species level using conventional entomological keys and molecular methods.

Oligonychus perditus Pritchard and Baker (1955) (syn. *Oligonychus chamaecyparissae*, Ma and Yuan, 1976) (Acari, Tetranychidae) was originally described based on specimens discovered in the USA on juniper imported from Japan into that country (Pritchard and Baker, 1955). This species was fully redescribed by Ehara (1962) together with seven additional species of the superfamily Tetranychoidae occurring on conifers in the island of Hokkaido (Japan).

3.1.2. Biology of the pest

In the Netherlands, *O. perditus* was proven to overwinter in the egg stage (Vierbergen, 1988), as does the cosmopolitan closely related species *Oligonychus ununguis* Jacobi, the spruce spider mite (Shinkaji, 1975a). In Japan, the eggs of *O. ununguis* entered diapause in September or October, when photoperiod reached 12.5 h light at 15–20°C (Shinkaji, 1975a), and terminated diapause in April or May, at temperatures over 5.6°C (Shinkaji, 1975b). This may also be the case for *O. perditus* (EPPO, 1997). Xu et al. (2002) found that the development of *O. perditus* at constant temperatures in the laboratory took between 29.4 and 7.8 days at 17 and 35°C, respectively, which may allow the development of up to 11 generations on the Mount Tai of Shandong province, China. Based on these results and taking into account the actual distribution of this species in eastern Asia (see Section 3.2.1), *O. perditus* could survive a wide range of temperatures (DEFRA, 2015). Another laboratory study carried out at a constant temperature of 25°C showed that *O. perditus* has an intrinsic rate of increase of 0.2/day and a mean generation time of 20 days (Xu and Sun, 2006). *O. perditus* attacks various species of *Juniperus*, *Chamaecyparis*, *Cryptomeria*, *Cupressus*, *Fokienia*, *Platycladus* and *Taxus* (see Section 3.4.1). As with most spider mites, the natural enemies of *O. perditus* include a wide range of generalist predators. In China, Xu et al. (2007, 2008) have identified several natural enemies.

3.1.3. Detection and identification of the pest

Are detection and identification methods available for the pest?

Yes. Detection is possible but at low density, plants can be asymptomatic and mites difficult to observe. Slide-mounted specimens can be identified by examining morphological features, for which keys exist.

Symptoms

Heavily infested plants can exhibit a range of symptoms including foliar discolouration, browning and distorted growth. At low magnification, feeding scars can be seen on part or the whole surface of scale leaves.

Morphology

O. perditus resembles many other species of spider mites with adults being less than 0.45 mm in body length and pale greenish yellow in colour. As a consequence, they are highly cryptic and difficult to detect with the naked eye when present at low density. This mite can only be identified by the morphological examination of slide-mounted specimens of both sexes in conjunction with published keys and descriptions (Ehara, 1962; Lo and Ho, 1989). The eggs are orange-red, sessile, laid solitary or in groups at the base of scale leaves.

3.2. Pest distribution

3.2.1. Pest distribution outside the EU

Oligonychus perditus is present only in Asia (Table 2, Figure 1).

Table 2: Current distribution of *Oligonychus perditus* outside Europe based on the information from the EPPO Global Database

Country (including subnational states)	EPPO Global Database Last updated: 13 September 2017 Date accessed: 24 October 2017
United States of America	Absent, intercepted only
China (Anhui, Gansu, Guangdong, Jiangsu, Qinghai, Shaanxi, Sichuan, Xianggang, Yunnan)	Present, no details
Japan (Hokkaido, Honshu)	Present, no details
Republic of Korea	Present, no details
Taiwan	Present, no details

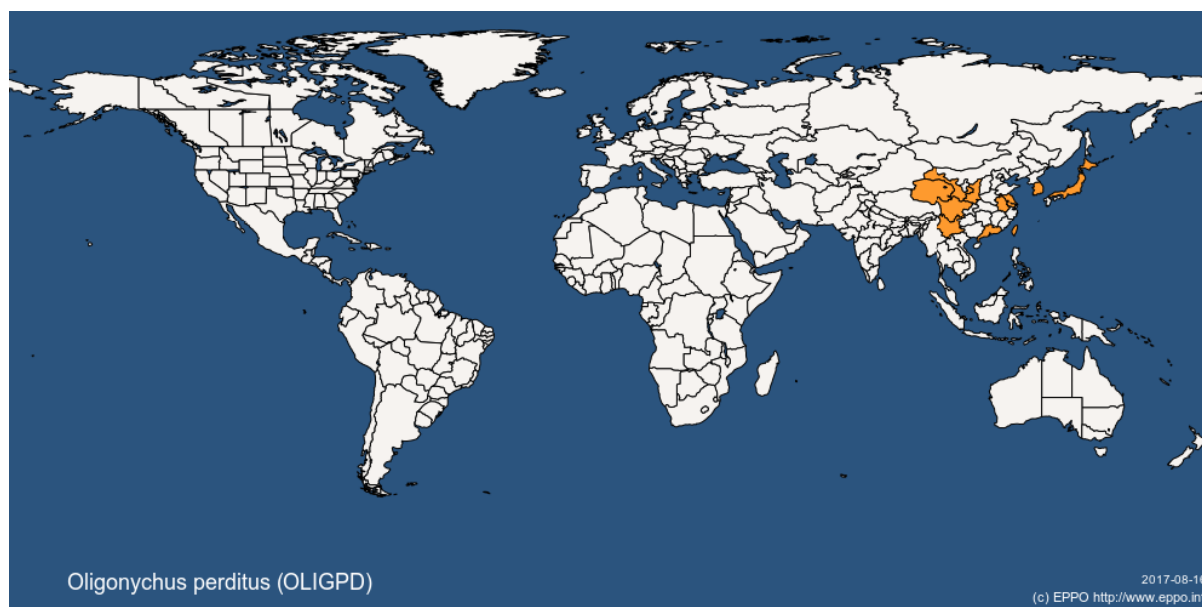


Figure 1: Global distribution map for *Oligonychus perditus* (extracted from the EPPO Global Database accessed on 24 October 2017)

3.2.2. Pest distribution in the EU

Is the pest present in the EU territory? If present, is the pest widely distributed within the EU?

No, *Oligonychus perditus* is not present in the EU. It has been reported absent and intercepted only in the Netherlands (see Section 3.4.3.2).

Given the fact that the pest remained undetected for 8 years and that it is easily confused with *O. ununguis*; there is an uncertainty concerning its current absence in the EU.

3.3. Regulatory status

3.3.1. Council Directive 2000/29/EC

Oligonychus perditus is listed in Council Directive 2000/29/EC. Details are presented in Tables 3 and 4.

Table 3: *Oligonychus perditus* in Council Directive 2000/29/EC

Annex II, Part A	Harmful organisms whose introduction into, and spread within, all member states shall be banned if they are present on certain plants or plant products	
Section I	Harmful organisms not known to occur in the community and relevant for the entire community	
(a)	Insects, mites and nematodes, at all stages of their development	
	Species	Subject of contamination
21.	<i>Oligonychus perditus</i> Pritchard and Baker	Plants of <i>Juniperus</i> L., other than fruit and seeds, originating in non-European countries.

3.3.2. Legislation addressing the hosts of *Oligonychus perditus*

Table 4: Regulated hosts and commodities that may involve *Oligonychus perditus* in Annex III of Council Directive 2000/29/EC

Annex III, Part A	Plants, plant products and other objects the introduction of which shall be prohibited in all Member States	
	Description	Country of origin
1.	Plants of [...] <i>Juniperus</i> L., [...] other than fruit and seeds	Non-European countries

Apart from Council Directive 2000/29/EC, there are derogations (of the import prohibition) for the import of bonsai plants from Japan and Korea:

- 2002/887/EC authorising derogations from certain provisions of Council Directive 2000/29/EC in respect of naturally or artificially dwarfed plants of *Chamaecyparis* Spach, *Juniperus* L. and *Pinus* L., originating in Japan.
- 2002/499/EC authorising derogations from certain provisions of Council Directive 2000/29/EC in respect of naturally or artificially dwarfed plants of *Chamaecyparis* Spach, *Juniperus* L. and *Pinus* L., originating in the Republic of Korea.

In these derogations, strict requirements are formulated for the import of bonsai plants from Japan and Korea. *O. perditus* is mentioned.

3.4. Entry, establishment and spread in the EU

3.4.1. Host range

According to DEFRA (2015) and EPPO (2017), the following host plants have been reported as hosts for *O. perditus*:

Cupressaceae: *Chamaecyparis funebris*; *Chamaecyparis obtusa*; *Chamaecyparis pisifera*; *Chamaecyparis* sp. *Cryptomeria japonica*; *Cupressus funebris*; *Fokienia hodginsii*; *Juniperus chinensis*; *Juniperus communis*; *Juniperus formosana*; *Juniperus x media*; *Juniperus rigida*; *Juniperus sabina*; *Juniperus* spp.; *Juniperus virginiana*; *Platycladus orientalis*.

Taxaceae: *Taxus cuspidata*.

The listed hosts above are all conifers. There are two records of non-coniferous hosts listed by CABI CPC (2014) (*Prunus salicina* (Rosaceae) and *Camellia sinensis* (Theaceae)). However, these are listed as host plants in the context of association with the habitat and are not known to be attacked by the pest and therefore are not considered to be true hosts.

The host plant genera *Juniperus*, *Chamaecyparis* and *Taxus* are regulated, but the Panel notes that *Cryptomeria*, *Cupressus*, *Fokienia* and *Platycladus* are currently not regulated.

3.4.2. Entry

Is the pest able to enter into the EU territory? If yes, identify and list the pathways.

YES, *O. perditus* could enter the EU on plants for planting.

The main pathways of entry are:

- Plants for planting, including bonsai plants
- Ornamental branches.

As presented in Table 5, there is trade of bonsai plants from Japan and Korea into some EU MS.

Table 5: *Juniperus* species (plants for planting) imported into EU from countries where *O. perditus* occurs (Source: ISEFOR database)

Country of origin/destination	Czech Republic	Germany	Italy	Netherlands	Belgium
Japan	↙	↙		↙	↙
Taiwan			↙		
China				↙	

O. perditus has been intercepted on *J. chinensis* bonsai plants and on other potted plants. A search of Europhyt notification of interceptions between January 1995 and August 2017 revealed that there were seven records of interceptions of *O. perditus*, the earliest being in 1999.

3.4.3. Establishment

Is the pest able to become established in the EU territory?

Yes, the host plants are present in the EU and there are no climatic constraints.

3.4.3.1. EU distribution of main host plants

Juniperus species are widely distributed in Europe (Figure 2).

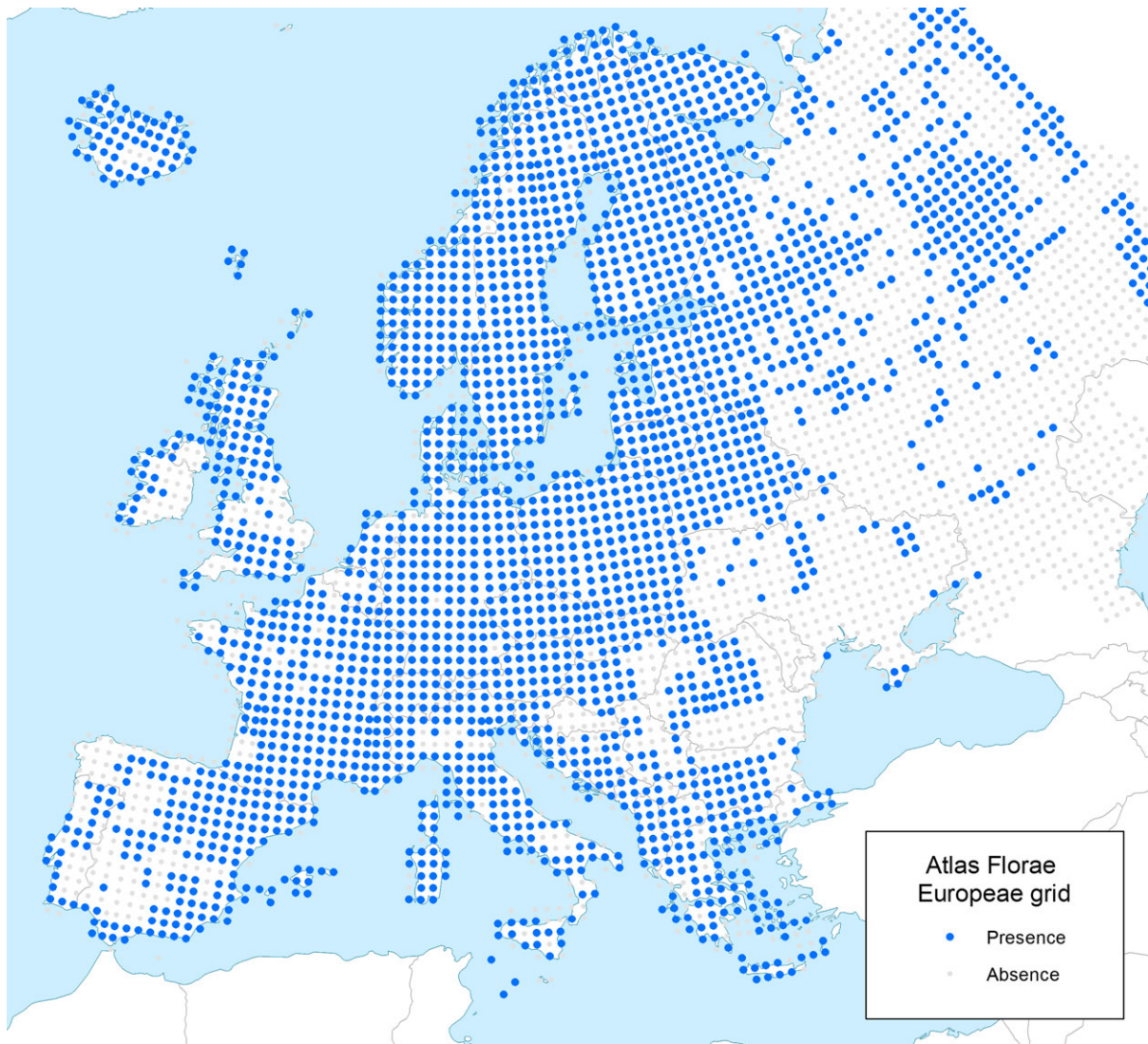


Figure 2: Distribution of the genus *Juniperus* according to *Atlas Florae Europaeae* (Jalas and Suominen, 1973). The map considers the following species: *Juniperus drupacea*, *J. communis* s.l., *J. oxycedrus*, *J. brevifolia*, *J. phoenicea*, *J. thurifera*, *J. foetidissima*, *J. excelsa*, *J. sabina*. It indicates where at least one of them is recorded in a 50 × 50 km grid in a Universal Transverse Mercator (UTM) projection

3.4.3.2. Climatic conditions affecting establishment

Based on the Köppen–Geiger climate zones (Figure 3), the known area of current distribution of *O. perditus* includes ecoclimatic zones that also occur in the EU.

In the Netherlands, a small population of *O. perditus* survived eight winters on a solitary imported plant in an educational garden. The plant was destroyed after the mites were found. For this population, it was confirmed that the mites overwinter as eggs (Vierbergen, 1988).

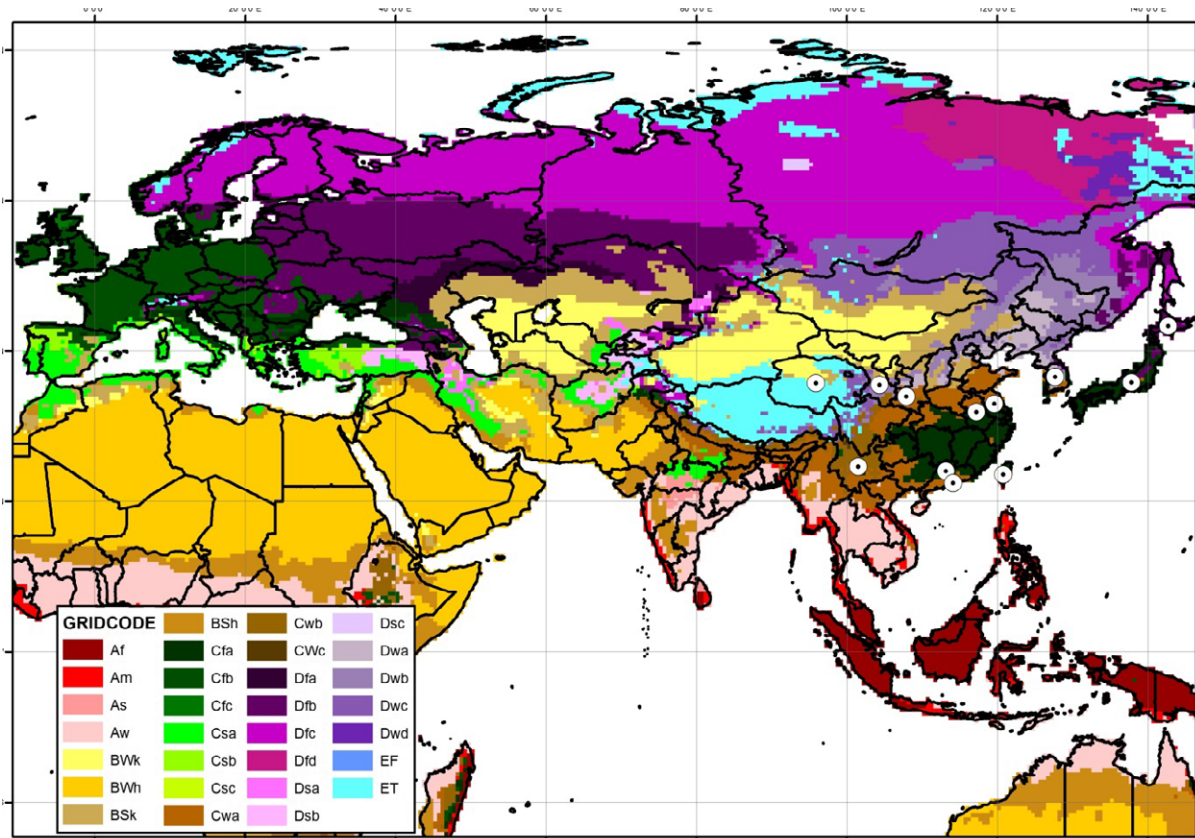


Figure 3: The current distribution of *Oligonychus perditus* presented by white dots on the Köppen–Geiger climate classification map (Kottek et al., 2006) of Asia.

3.4.4. Spread

Is the pest able to spread within the EU territory following establishment? How?

Yes, the pest would spread with plants for planting as well as by natural spread.

DEFRA (2015): 'Locally, spider mites are able to move readily between plants. Long range natural spread is dependent on the wind or carriage with animals, such as birds and insects. Potentially spider mites may be able to disperse widely on air currents. However, when a population of *O. perditus* was found to have survived for eight years in the Netherlands, the mites had remained on the plant on which they were imported and no other infestations were found in the surrounding area, although it is not known if other hosts were present (CABI CPC, 2014). Spread with trade is likely to be more rapid, carried on planting material'.

3.5. Impacts

Would the pests' introduction have an economic or environmental impact on the EU territory?

Yes. However, current evidence suggests that impact would most likely be small, based on the presence in the EU of a close species (*O. ununguis*), with a range of common host plants, and for which growers are already using chemical control. *Juniperus communis* is considered a threatened species (Gauquelin et al., 1999; Verheyen et al., 2009; Farjon, 2013) and therefore any additional impact on this species could be important.

Hong (1996) reported *O. perditus* as being one of the species causing severe damage to ornamental plants in the Jiangxi Province of China. In Japan, the pest has been reported as causing significant damage to *J. chinensis* (Ehara and Lee, 1971; Anonymous, 1980; DEFRA, 2015). In the Netherlands (Vierbergen, 1988), the pest caused severe feeding damage on intercepted *Juniperus* bonsai plants. However, the fact that, in the same country, an infestation in an educational garden

remained unnoticed for 8 years, suggests that damage can take that long to be noticed. This also reflects how difficult its detection may be (DEFRA, 2015).

Of particular concern would be the planting of infested *Juniperus* spp. in the wild posing a risk to the wild *J. communis*, but the only junipers coming in from areas where the mite is present are bonsai plants under derogation (DEFRA, 2015).

3.6. Availability and limits of mitigation measures

Are there measures available to prevent the entry into, establishment within or spread of the pest within the EU such that the risk becomes mitigated?

Yes: regulatory measures; cultural control; chemical control; biological control.

3.6.1. Biological or technical factors limiting the feasibility and effectiveness of measures to prevent the entry, establishment and spread of the pest

- The small size of this mite and its colour (greenish) make its detection difficult. The eggs are also difficult to detect.
- Asymptomatic plants with low mite densities are difficult to detect.
- Tetranychid mites are highly ranked for pesticide resistance.
- Eggs (the overwintering stage), which could be present on bonsai plants imported from Japan and Korea during winter months may be difficult to target even with pesticides.

3.6.2. Control methods

Control methods include:

- Regulatory measures: use of certified planting material, establishment of pre- and post-entry quarantine requirements (e.g. growing in isolation for one or more life cycles of the pest) and establishment of pest-free production places (e.g. in Japan and Korea for exported bonsai plants).
- Cultural control: sanitation and destruction of infested material.
- Chemical control: use of acaricides (e.g. abamectin).
- Biological control: natural control is presumed to occur in the native range of this mite. Some of these natural enemies (or closely related species) occur in the EU. Some of these enemies are commercially available for augmentative releases.

3.7. Uncertainty

Given the fact that the pest remained undetected for 8 years and that it is easily confused with *O. ununguis*, a cosmopolitan species coexisting with *O. perditus* in Asia; there is an uncertainty concerning its impact and current absence in the EU.

J. communis is considered a threatened species, and therefore, any additional impact on this species could be important. However, it is not known how important the additional impact would be because the degree of overlap between *O. perditus* and *O. ununguis* is unknown.

4. Conclusions

All criteria assessed by EFSA above for consideration as a potential quarantine pest were met. The species is presently absent from the EU, and thus, the criteria for consideration as a potential regulated non-quarantine pest are not met (Table 6).

Table 6: The Panel’s conclusions on the pest categorisation criteria defined in Regulation (EU) 2016/2031 on protective measures against pests of plants (the number of the relevant sections of the pest categorisation is shown in brackets in the first column)

Criterion of pest categorisation	Panel’s conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel’s conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Identity of the pest (Section 3.1)	The identity of the pest is established. It can be identified to the species level using conventional entomological keys and molecular methods.	The identity of the pest is established. It can be identified to the species level using conventional entomological keys and molecular methods.	None
Absence/presence of the pest in the EU territory (Section 3.2)	The pest is absent from the EU territory.	The pest is absent from the EU territory. It thus cannot be a regulated non-quarantine pest.	Given the fact that the pest remained undetected for 8 years and that it is easily confused with <i>O. ununguis</i> , there is an uncertainty concerning its current absence in the EU.
Regulatory status (Section 3.3)	The pest is regulated in Council Directive 2000/29/EC, Annex II, Part A, Section I, on plants of <i>Juniperus</i> , other than fruit and seeds, originating in non-European countries. Two of the host plants, <i>Juniperus</i> and <i>Chamaecyparis</i> , are regulated in Council Directive 2000/29/EC, Annex III, Part A.	The pest is regulated in Council Directive 2000/29/EC, Annex II, Part A, Section I, on plants of <i>Juniperus</i> , other than fruit and seeds, originating in non-European countries. Two of the host plants, <i>Juniperus</i> and <i>Chamaecyparis</i> , are regulated in Council Directive 2000/29/EC, Annex III, Part A.	
Pest potential for entry, establishment and spread in the EU territory (Section 3.4)	The pest has been intercepted seven times on <i>Juniperus chinensis</i> bonsai plants and on other potted plants between January 1995 and August 2017. The pest was present on one plant in the Netherlands for 8 years, but did not spread.	Plants for planting are the main pathway.	Natural spread is poorly documented.
Potential for consequences in the EU territory (Section 3.5)	Impact would most likely be small because of the presence in the EU of a close species (<i>O. ununguis</i>) for which growers are already using chemical control.	Impact would most likely be small, because of the presence in the EU of a close species (<i>O. ununguis</i>) for which growers are already using chemical control.	<i>Juniperus communis</i> is considered a threatened species and therefore any additional impact on this species could be important. However, this plant species coexists with <i>O. perditus</i> and <i>O. ununguis</i> in the Far East and this coincidence has not been reported to increase damage.

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Available measures (Section 3.6)	The regulatory measures in Council Directive 2000/29/EC, Annex II, Part A, Section I, and Annex III, Part A are available to prevent the entry into, establishment within or spread of the pest within the EU so that the risk becomes mitigated.	The regulatory measures in Council Directive 2000/29/EC, Annex II, Part A, Section I, and Annex III, Part A are available to prevent the entry into, establishment within or spread of the pest within the EU so that the risk becomes mitigated.	The host plant genera <i>Juniperus</i> , <i>Chamaecyparis</i> and <i>Taxus</i> are regulated, but the Panel notes that <i>Cryptomeria</i> , <i>Cupressus</i> , <i>Fokienia</i> and <i>Platycladus</i> are currently not regulated
Conclusion on pest categorisation (Section 4)	All criteria assessed by EFSA above for consideration as a potential quarantine pest were met, though there are some uncertainties regarding impacts.	The pest is absent from the EU. Therefore, the criteria assessed by EFSA above for consideration as a potential regulated non-quarantine pest are not met.	See uncertainties listed above.
Aspects of assessment to focus on/scenarios to address in future if appropriate	The limited impact expected from this pest does not justify further assessments or scenarios.		

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Abbreviations

CABI	The Crop Protection Compendium
EPPO	European and Mediterranean Plant Protection Organization
FAO	Food and Agriculture Organization
IPPC	International Plant Protection Convention
MS	Member State
PHYSAN	Phyto-Sanitary Controls
PLH	EFSA Panel on Plant Health
TFEU	Treaty on the Functioning of the European Union
ToR	Terms of Reference
UTM	Universal Transverse Mercator