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Pest categorisation of *Didesmococcus unifasciatus*

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Abstract

The EFSA Panel on Plant Health performed a pest categorisation of *Didesmococcus unifasciatus* (Hemiptera: Sternorrhyncha: Coccidae) for the EU following commodity risk assessments of *Malus domestica* (apple), *Prunus dulcis* (almond) and *P. persica* (peach) plants for planting from Türkiye in which *D. unifasciatus* was identified as a pest that could potentially enter the EU. It was first described in Uzbekistan and is widely distributed in Central and Western Asia, including Türkiye (where it was recently reported as limited to the Hakkari and Diyarbakir regions in the Asian part of the country). It has not been reported within the EU. It is not listed in Annex II of Commission Implementing Regulation (EU) 2019/2072. It completes one generation per year; a female lays between 1,500 and 2,400 eggs. It feeds on several important fruit trees of the family Rosaceae (e.g. *P. dulcis*, *M. domestica*), as well as *Ficus carica* and *Ulmus* sp. Most of its hosts are widely cultivated in the EU. Woody plants for planting and cut branches are the main potential pathways for entry of *D. unifasciatus* into the EU. Climatic conditions and availability of host plants would likely allow this species to establish and spread in southern parts of the EU. Just as in other invaded areas, the presence of many of its natural enemies in the EU is likely to prevent the scale from becoming an economic or environmental pest. Nevertheless, phytosanitary measures are available to reduce the likelihood of entry and spread. Considering the weight of evidence, *D. unifasciatus* does not meet all the criteria that are within the remit of EFSA to assess for this species to be regarded as a potential Union quarantine pest.

Keywords: pest risk, plant health, plant pest, quarantine, *Prunus*, Coccidae

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1. Introduction

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

1.1.1. Background

The new Plant Health Regulation (EU) 2016/2031, on the protective measures against pests of plants, is applying from 14 December 2019. Conditions are laid down in this legislation in order for pests to qualify for listing as Union quarantine pests, protected zone quarantine pests or Union regulated non-quarantine pests. The lists of the EU regulated pests together with the associated import or internal movement requirements of commodities are included in Commission Implementing Regulation (EU) 2019/2072. Additionally, as stipulated in the Commission Implementing Regulation 2018/2019, certain commodities are provisionally prohibited to enter in the EU (high risk plants, HRP). EFSA is performing the risk assessment of the dossiers submitted by exporting to the EU countries of the HRP commodities, as stipulated in Commission Implementing Regulation 2018/2018. Furthermore, EFSA has evaluated a number of requests from exporting to the EU countries for derogations from specific EU import requirements.

In line with the principles of the new plant health law, the European Commission with the Member States are discussing monthly the reports of the interceptions and the outbreaks of pests notified by the Member States. Notifications of an imminent danger from pests that may fulfil the conditions for inclusion in the list of the Union quarantine pest are included. Furthermore, EFSA has been performing horizon scanning of media and literature.

As a follow-up of the above-mentioned activities (reporting of interceptions and outbreaks, HRP, derogation requests and horizon scanning), a number of pests of concern have been identified. EFSA is requested to provide scientific opinions for these pests, in view of their potential inclusion by the risk manager in the lists of Commission Implementing Regulation (EU) 2019/2072 and the inclusion of specific import requirements for relevant host commodities, when deemed necessary by the risk manager.

1.1.2. Terms of Reference

EFSA is requested, pursuant to Article 29(1) of Regulation (EC) No 178/2002, to provide scientific opinions in the field of plant health.

EFSA is requested to deliver 53 pest categorisations for the pests listed in Annex 1A, 1B, 1D and 1E (for more details see mandate M-2021-00027 on the Open.EFSA portal). Additionally, EFSA is requested to perform pest categorisations for the pests so far not regulated in the EU, identified as pests potentially associated with a commodity in the commodity risk assessments of the HRP dossiers (Annex 1C; for more details see mandate M-2021-00027 on the Open.EFSA portal). Such pest categorisations are needed in the case where there are not available risk assessments for the EU.

When the pests of Annex 1A are qualifying as potential Union quarantine pests, EFSA should proceed to phase 2 risk assessment. The opinions should address entry pathways, spread, establishment, impact and include a risk reduction options analysis.

Additionally, EFSA is requested to develop further the quantitative methodology currently followed for risk assessment, in order to have the possibility to deliver an express risk assessment methodology. Such methodological development should take into account the EFSA Plant Health Panel Guidance on quantitative pest risk assessment and the experience obtained during its implementation for the Union candidate priority pests and for the likelihood of pest freedom at entry for the commodity risk assessment of High Risk Plants.

1.2. Interpretation of the Terms of Reference

Didesmococcus unifasciatus is one of a number of pests listed in Annex 1C to the Terms of Reference (ToR) to be subject to pest categorisation to determine whether it fulfils the criteria of a potential Union quarantine pest for the area of the EU excluding Ceuta, Melilla and the outermost regions of Member States referred to in Article 355(1) of the Treaty on the Functioning of the European Union (TFEU), other than Madeira and the Azores, and so inform EU decision-making as to its appropriateness for potential inclusion in the lists of pests of Commission Implementing Regulation (EU) 2019/2072. If a pest fulfils the criteria to be potentially listed as a Union quarantine pest, risk reduction options will be identified.

1.3. Additional information

This pest categorisation was initiated following the commodity risk assessments of *Malus domestica*, *Prunus persica* and *P. dulcis* plants from Türkiye performed by EFSA (EFSA PLH Panel, 2022, 2023), in which *D. unifasciatus* was identified as a relevant non-regulated EU pest which could potentially enter the EU on *M. domestica, P. persica* and *P. dulcis*.

2. Data and methodologies

2.1. Data

2.1.1. Literature search

A literature search on *D. unifasciatus* 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. Papers relevant for the pest categorisation were reviewed, and further references and information were obtained from experts, as well as from citations within the references and grey literature.

2.1.2. Database search

Pest information, on host(s) and distribution, was retrieved from the European and Mediterranean Plant Protection Organization (EPPO) Global Database (EPPO, online), the CABI databases and scientific literature databases as referred above in Section 2.1.1.

Data about the import of commodity types that could potentially provide a pathway for the pest to enter the EU and about the area of hosts grown in the EU were obtained from EUROSTAT (Statistical Office of the European Communities).

The Europhyt and TRACES databases were consulted for pest-specific notifications on interceptions and outbreaks. Europhyt is a web-based network run by the Directorate General for Health and Food Safety (DG SANTÉ) of the European Commission as a subproject of PHYSAN (PhytoSanitary Controls) specifically concerned with plant health information. TRACES is the European Commission's multilingual online platform for sanitary and phytosanitary certification required for the importation of animals, animal products, food and feed of non-animal origin and plants into the European Union, and the intra-EU trade and EU exports of animals and certain animal products. Up until May 2020, the Europhyt database managed 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 Member States and the phytosanitary measures taken to eradicate or avoid their spread. The recording of interceptions switched from Europhyt to TRACES in May 2020.

GenBank was searched to determine whether it contained any nucleotide sequences for *D. unifasciatus* which could be used as reference material for molecular diagnosis. GenBank® (www.ncbi.nlm.nih.gov/genbank/) is a comprehensive publicly available database that as of August 2019 (release version 227) contained over 6.25 trillion base pairs from over 1.6 billion nucleotide sequences for 450,000 formally described species (Sayers et al., 2020).

2.2. Methodologies

The Panel performed the pest categorisation for *D. unifasciatus*, following guiding principles and steps presented in the EFSA guidance on quantitative pest risk assessment (EFSA PLH Panel, 2018), the EFSA guidance on the use of the weight of evidence approach in scientific assessments (EFSA Scientific Committee, 2017) and the International Standards for Phytosanitary Measures No 11 (FAO, 2013).

The criteria to be considered when categorising a pest as a potential Union quarantine pest (QP) is given in Regulation (EU) 2016/2031 Article 3 and Annex I, Section 1 of the Regulation. Table 1 presents the Regulation (EU) 2016/2031 pest categorisation criteria on which the Panel bases its conclusions. In judging whether a criterion is met the Panel uses its best professional judgement (EFSA Scientific Committee, 2017) by integrating a range of evidence from a variety of sources (as presented above in Section 2.1) to reach an informed conclusion as to whether or not a criterion is satisfied.

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, deemed to be a risk management decision, the Panel will present a summary of the observed impacts in the areas where the pest occurs, and make a judgement about potential likely impacts in the EU. Whilst the Panel may quote impacts reported from areas where the pest occurs in monetary terms, the Panel will seek to express potential EU impacts in terms of yield and quality losses and not in monetary terms, in agreement with the EFSA guidance on quantitative pest risk assessment (EFSA PLH Panel, 2018). Article 3 (d) of Regulation (EU) 2016/2031 refers to unacceptable social impact as a criterion for quarantine pest status. Assessing social impact is outside the remit of the Panel.

Table 1: Pest categorisation criteria under evaluation, as derived from 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 (article 3)
Identity of the pest (Section 3.1)	Is the identity of the pest clearly defined, 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 in a limited part of the EU or is it scarce, irregular, isolated or present infrequently? If so, the pest is considered to be not widely distributed.
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 for entry and spread.
Potential for consequences in the EU territory (Section 3.5)	Would the pests' introduction have an economic or environmental impact on the EU territory?
Available measures (Section 3.6)	Are there measures available to prevent pest entry, establishment, spread or impacts?
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.

3. Pest categorisation

3.1. Identity and biology of the pest

3.1.1. Identity and taxonomy

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

Yes, the identity of the pest is established and *Didesmococcus unifasciatus* (Archangelskaya) is the accepted name.

D. unifasciatus (Archangelskaya) is an insect within the order Hemiptera, family Coccidae. *D. unifasciatus* was originally described as *Physokermes unifasciatus* by Archangelskaya in 1923 from specimens collected in Uzbekistan on *P. persica* (García Morales et al., 2016).

No EPPO code[1] (Griessinger and Roy, 2015; EPPO, 2019) is available for this species.

3.1.2. Biology of the pest

The biology of *D. unifasciatus* was studied in Lebanon (Talhouk, 1975). It completes one generation per year; adults of both sexes appear and mate during April. Fertilised females double their size between the end of April, when copulation occurs and the oviposition period in mid-June. A female

[1] An EPPO code, formerly known as a Bayer code, is a unique identifier linked to the name of a plant or plant pest important in agriculture and plant protection. Codes are based on genus and species names. However, if a scientific name is changed the EPPO code remains the same. This provides a harmonised system to facilitate the management of plant and pest names in computerised databases, as well as data exchange between IT systems (Griessinger and Roy, 2015; EPPO, 2019).

lays between 1,500 and 2,400 eggs in 3 to 5 days, and egg hatching occurs 4 to 5 days later. The female passes through three nymphal instars and the male through four instars. The emerging crawlers feed for several weeks and enter a summer diapause. They may settle under empty male tests (waxy covers that protect the pupal stage) or any other cover that gives them protection from direct sunlight. In autumn they moult and the nymphs settle in dense colonies on tree twigs, branches and seldom on the trunk of mature trees; in almonds, many nymphs settle in the folds of bark at the base of spurs (young branches) (Talhouk, 1975). After feeding for a while, they may undergo a winter diapause, as second instar nymphs, which lasts till the following spring (Gerson and Applebaum, 2019). *D. unifasciatus* though does not seem to have a true diapause period in Lebanon (Talhouk, 1975).

This scale has a large number of natural enemies that keep it under control. In Lebanon, predators were found, namely the coccinellids *Exochomus* sp. and *Chilocorus bipustulatus* (L.), and the larvae of the noctuids, *Eublemma scitula* Ramb and *Calymma communimacula*, Schiff., whose caterpillars feed voraciously on the eggs and crawlers. The coccinellids were observed in mid-March and early April feeding on the pre-adult and young adult stages, while the larvae of *E. scitula* were found in late June and early July feeding on adults, eggs and neonate nymphs. Various parasitoid species were reared from this scale in Lebanon: *Coccophagus lycimnia* Walker and *C. scutellaris* Dalm. (Hymenoptera: Aphelinidae) that emerge from young and gravid females, *Microterys sylvius* Dalman and *Metaphycus punctipes* Dalman (Hymenoptera: Encyrtidae). All three species emerged from young adult females late in May and early in June (Talhouk, 1975). Two other species, *Pachyneuron concolor* (Froster) (Hymenoptera: Pteromalidae), and *Marietta picta* (Andre) (Hymenoptera: Aphelinidae) also emerged from the adult scale, the last being a hyperparasite on one or more of the above-mentioned parasitic species, while the status of the *Pachyneuron* species is not definitely known (Talhouk, 1975, 1978). Natural enemies were recorded also in newly colonised areas; indeed, in Türkiye four parasitoid species *Coccophagus piceae* Erdos, C. *lycimnia*, *Microterys hortulanus* (Erdos), *Metaphycus* sp. Near *zebratus* (Mercet) (Hymenoptera: Encyrtidae) and one hyperparasitoid species *Pachyneuron muscarum* (Linnaeus) (Hymenoptera: Pteromalidae) were reared from *D. unifasciatus* (Bolu, 2012). In Iran, *C. lycimnia* was also recorded developing on this scale (Abolmasoumi et al., 2009).

3.1.3. Host range/species affected

D. *unifasciatus* has been recorded on *F. carica, M. domestica*, *P.* spp. and *Ulmus* sp. (Bolu, 2012; Çiftçi and Bolu, 2021; Garcia Morales et al., 2016). See Annex A for a complete list of host plants.

3.1.4. Intraspecific diversity

No intraspecific diversity is reported for this species.

3.1.5. Detection and identification of the pest

Are detection and identification methods available for the pest?

Yes, visual detection is possible, and morphological identification methods are available.

A good description and illustration of the adult female is provided by Hodgson (1994). Good descriptions of the adult female, first instar nymph, female and male last-instar nymphs are given by Borchsenius (1957).

Symptoms

Infestation by this scale can result in the death of almond trees after 3 to 5 years. Plant damage might not be obvious in early infestation or during dormancy (due to absence of leaves), but the presence of scales on the plants could be detected by the presence of wax, honeydew, sooty mould and ants feeding on the honeydew.

Detection

Careful visual examination of plants is an effective way for the detection of *D. unifasciatus*. Nymphs can be seen in dense colonies on host twigs in the autumn (Gerson and Applebaum, 2019). Mass colonisation occurs mostly on the lower sides of either the previous year's, or rarely the current year's

growth, usually on the north-eastern sides of the trees (Talhouk, 1975). Yellow sticky traps can also be used to determine the presence of the winged adult males.

Identification

The identification of *D. unifasciatus* requires microscopic examination and verification of the presence of key morphological characteristics. Detailed morphological descriptions, illustrations and keys to adult and last nymphal instars of *D. unifasciatus* can be found in Borchsenius (1957), Hodgson (1994) and Tang (1991). No molecular identification protocols were found during the literature search.

Description

Nymphs

Throughout all its developmental stages, the insect has well-developed, functional legs. In about a day after settling, the first instar nymph starts to secrete an oval creamy to dirty white waxy cover over its body. This nymphal instar is characterised by an antenna composed of six segments, the sixth being slightly club-shaped. The second instar nymph has seven antennal segments, with the third being more than twice as long as the second or the fourth and the seventh pointed, truncated cone shaped. At the third instar sexual dimorphism starts to become apparent. Male pre-pupae and puparia become elongate and become raised along the mid-dorsal line. The average length of a male pupal case is 1.72 mm. Together with male pupal elongation female scales acquire a convex spheroidal shape, initially 2.0 and 2.5 mm in diameter and 1.9 mm height. In general, individuals destined to become females settle on the borders of a colony while males occupy the centre (Talhouk, 1975).

Adults

In Lebanon, males begin to emerge and fly by the end of April for about 2 weeks. They emerge sexually mature and copulate after a short inspection of females in a colony.

The females are large and globular, dark red in colour with a red horizontal band about 0.8 mm wide. This band lies over the anterior abdominal terga of the animal. The colour of the body is wine red, except for the terga which has a lighter colour throughout the preoviposition phase. Adult females have eight antennal segments. After copulation, their size increases rapidly up to a maximum of about 4 mm in diameter and 5 mm in height. The gravid female is practically an eggsack and fills the whole volume under the scale with thousands of eggs. As oviposition starts the body shrinks with the extrusion of eggs, which is completed in 3–5 days, besides, the female stops egesting honeydew and the ants, particularly attracted by the copious honeydew egested by the young female adults, disappear. When oviposition is completed, the dorsum of the insect loses its shiny aspect, becomes dull brown and the horizontal red band disappears (Talhouk, 1975).

3.2. Pest distribution

3.2.1. Pest distribution outside the EU

D. unifasciatus is widely distributed in Central Asia where it is reported from Afghanistan, Armenia, Iran, Lebanon, Tajikistan, Türkiye and Turkmenistan; it is also reported in Western Asia in China (Inner Mongolia) and Mongolia (Ben-Dov, 1993; Kaydan et al. 2009; Kaydan and Kozár, 2010) (Figure 1).

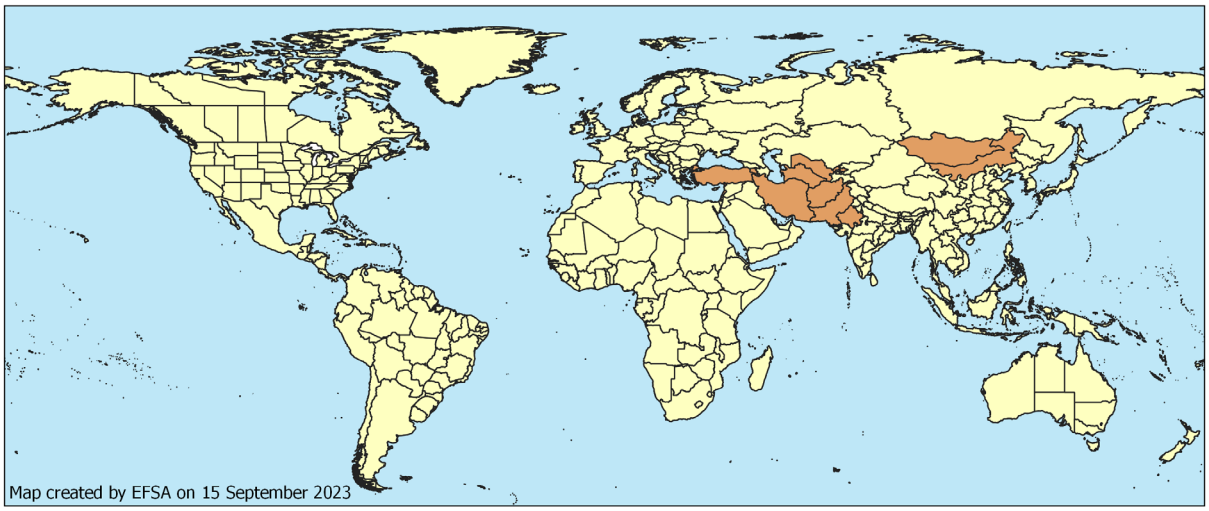

Figure 1: Global distribution of *Didesmococcus unifasciatus* (data source: CABI CPC [CABI, online], Garcia Morales et al. [2016] [Scalenet] accessed on: 15 June 2023 and literature)

3.2.2. Pest distribution in the EU

Is the pest present in the EU territory? If present, is the pest in a limited part of the EU or is it scarce, irregular, isolated or present infrequently? If so, the pest is considered to be not widely distributed.

No. *D. unifasciatus* is not known to occur in the EU.

3.3. Regulatory status

3.3.1. Commission Implementing Regulation 2019/2072

D. unifasciatus is not listed in Annex II of Commission Implementing Regulation (EU) 2019/2072, an implementing act of Regulation (EU) 2016/2031, or in any emergency plant health legislation.

3.3.2. Hosts or species affected that are prohibited from entering the Union from third countries

Table 2 lists regulated articles prohibited from entering the EU and relevant to the entry of *D. unifasciatus*.

Table 2: List of plants, plant products and other objects that are *Didesmococcus unifasciatus* hosts whose introduction into the Union from certain third countries is prohibited (Source: Commission Implementing Regulation (EU) 2019/2072, Annex VI)

List of plants, plant products and other objects whose introduction into the Union from certain third countries is prohibited			
	Description	**CN code**	**Third country, group of third countries or specific area of third country**
8.	Plants for planting of [. . .] *Malus* Mill., *Prunus* L., [. . .]., other than dormant plants free from leaves, flowers and fruits	ex 0602 10 90 ex 0602 20 20 ex 0602 20 80 ex 0602 40 00 ex 0602 90 41 ex 0602 90 45 ex 0602 90 46 ex 0602 90 47 ex 0602 90 48 ex 0602 90 50	Third countries other than Albania, Andorra, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Canary Islands, Faeroe Islands, Georgia, Iceland, Liechtenstein, Moldova, Monaco, Montenegro, North Macedonia, Norway, Russia (only the following parts: Central Federal District (Tsentralny federalny okrug), Northwestern Federal District (Severo- Zapadny federalny okrug), Southern Federal District (Yuzhny federalny okrug), North Caucasian Federal District (Severo-Kavkazsky federalny okrug) and Volga Federal District (Privolzhsky federalny okrug)), San Marino,

List of plants, plant products and other objects whose introduction into the Union from certain third countries is prohibited			
	Description	**CN code**	**Third country, group of third countries or specific area of third country**
		ex 0602 90 70 ex 0602 90 91 ex 0602 90 99	Serbia, Switzerland, Türkiye, Ukraine and the United Kingdom
9.	Plants for planting of [. . .]., *Malus* Mill., *Prunus* L. [..]. and their hybrids, [..]	ex 0602 10 90 ex 0602 20 20 ex 0602 90 30 ex 0602 90 41 ex 0602 90 45 ex 0602 90 46 ex 0602 90 48 ex 0602 90 50 ex 0602 90 70 ex 0602 90 91 ex 0602 90 99	Third countries other than Albania, Algeria, Andorra, Armenia, Australia, Azerbaijan, Belarus, Bosnia and Herzegovina, Canada, Canary Islands, Egypt, Faeroe Islands, Georgia, Iceland, Israel, Jordan, Lebanon, Libya, Liechtenstein, Moldova, Monaco, Montenegro, Morocco, New Zealand, North Macedonia, Norway, Russia (only the following parts: Central Federal District (Tsentralny federalny okrug), Northwestern Federal District (Severo-Zapadny federalny okrug), Southern Federal District (Yuzhny federalny okrug), North Caucasian Federal District (Severo- Kavkazsky federalny okrug) and Volga Federal District (Privolzhsky federalny okrug)), San Marino, Serbia, Switzerland, Syria, Tunisia, Türkiye, Ukraine, the United Kingdom and United States other than Hawaii

3.4. Entry, establishment and spread in the EU

3.4.1. Entry

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

Yes, the pest can enter the EU territory. The pathways are woody plants for planting and cut branches.

Comment on plants for planting as a pathway.

Plants for planting provide one of the main pathways for *D. unifasciatus* to enter the EU (Table 3).

Possible pathways of entry for *D. unifasciatus* are plants for planting (excluding seeds) and cut branches (Table 3).

Table 3: Potential pathways for *Didesmococcus unifasciatus* into the EU

Pathways (e.g. host/intended use/source)	Life stage	Relevant mitigations [e.g. prohibitions (Annex VI), special requirements (Annex VII) or phytosanitary certificates (Annex XI) within Implementing Regulation 2019/2072]
Woody plants for planting	All life stages	Plants for planting that are hosts of *D. unifasciatus* and are prohibited from third countries (Regulation 2019/2072, Annex VI) are listed in Table 3. Plants for planting from third countries require a phytosanitary certificate (Regulation 2019/2072, Annex XI, Part A). Some hosts are considered high risk plants (Regulation EU 2018/2019) for the EU and their import is prohibited subject to risk assessment.
Cut branches	All life stages	Foliage, branches and other parts of plants of *Prunus* spp., without flowers or flower buds, being goods of a kind suitable for bouquets or for ornamental purposes, fresh from third countries where the species occur require a phytosanitary certificate (Regulation 2019/2072, Annex XI, Part A). Foliage, branches and other parts of plants of various hosts of *D. unifasciatus*, without flowers or flower buds and grasses, mosses and lichens, being goods of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise

Pathways (e.g. host/intended use/source)	Life stage	Relevant mitigations [e.g. prohibitions (Annex VI), special requirements (Annex VII) or phytosanitary certificates (Annex XI) within Implementing Regulation 2019/2072]
		prepared: – Fresh: ex 0604 20 90 from third countries other than Switzerland require a phytosanitary certificate for their introduction into a protected zone from certain third countries of origin or dispatch (Regulation 2019/2072, Annex XII, Part C).

For some of the host plants whose introduction in the EU is prohibited, some of the third countries where the pest is reported to be present are excluded from the prohibition (i.e. *Malus* sp. and *Prunus* sp. and their hybrids from Türkiye). However, *Malus* Mill, *Prunus* L. and *Ficus carica* L. are included in the list of high-risk plants whose introduction is prohibited until a full risk assessment has been carried out.

Notifications of interceptions of harmful organisms began to be compiled in Europhyt in May 1994 and in TRACES in May 2020. As at 24.8.2023, there were no records of interception of *D. unifasciatus* in the Europhyt and TRACES databases.

3.4.2. Establishment

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

Yes. Some areas of southern EU countries provide suitable environmental conditions (climate and hosts) for the establishment of *D. unifasciatus*. Establishment outdoors in central and northern Europe is unlikely.

3.4.2.1. EU distribution of main host plants

D. unifasciatus is a polyphagous pest infesting fruit trees mainly belonging to the family Rosaceae. The main hosts of the pest cultivated in the EU 27 between 2017 and 2021 are shown in Table 4. Among others, apples, almond and peaches are important crops in the EU.

Table 4: Crop area of *Didesmococcus unifasciatus* hosts in the EU in 10,000 ha (Eurostat accessed on 15 June 2023)

Crop	2017	2018	2019	2020	2021
Almonds	742.78	773.88	809.56	852.95	881.33
Apples	504.61	506.27	491.08	484.63	492.52
Figs	24.63	24.99	25.59	27.63	25.79
Peaches	154.06	150.80	144.78	137.07	133.03

3.4.2.2. Climatic conditions affecting establishment

D. unifasciatus occurs mainly in central and western Asia. The thermal biology of this pest is little studied and no temperature thresholds for development have been reported. Consequently, there is some uncertainty regarding the climatic requirements of the pest. Figure 2 shows the world distribution of Köppen–Geiger climate types that occur in the EU and which occur in countries where *D. unifasciatus* has been reported. Based on locations where *D. unifasciatus* is reported in literature, southern EU countries may provide suitable climatic conditions for establishment.

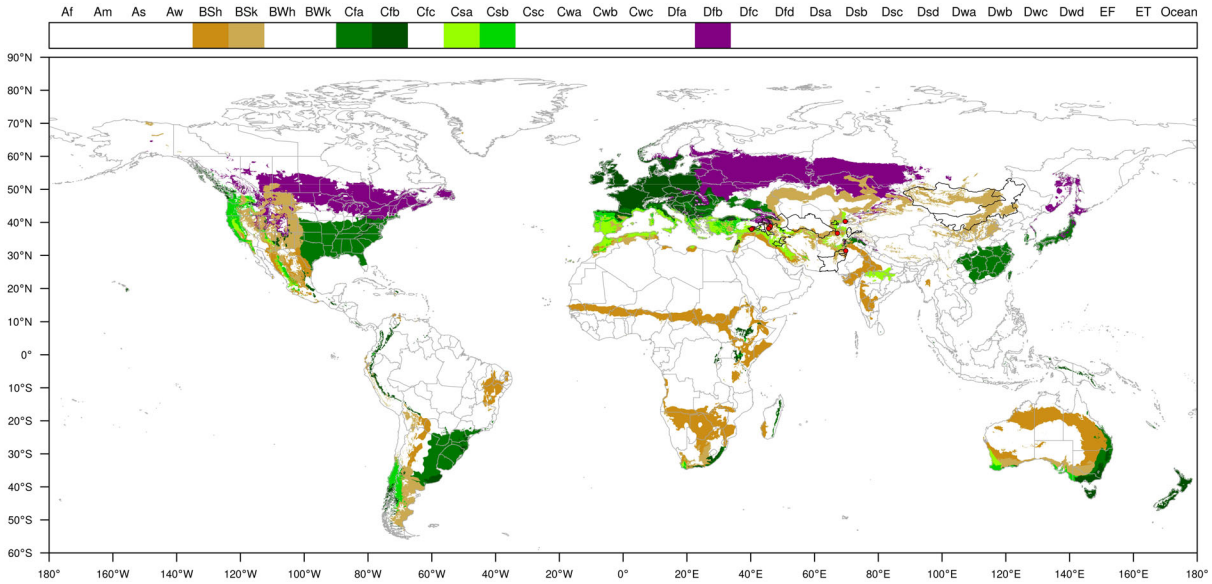

Figure 2: World distribution of seven Köppen–Geiger climate types (BSh, BSk, Cfa, Cfb, Csa, Csb, Dfb) that occur in the EU and which occur in countries where *Didesmococcus unifasciatus* has been reported

3.4.3. Spread

Describe how the pest would be able to spread within the EU territory following establishment?

Natural spread by first instar nymphs crawling or being carried by wind, other animals or machinery, will occur locally and relatively slowly. All stages may be moved over long distances in trade of infested plant materials, specifically plants for planting and cut branches.

Plants for planting provide a main spread mechanism for *D. unifasciatus* over long distances.

First instar nymphs (crawlers) may either crawl to neighbouring plants or be carried to them by wind or by hitchhiking on clothing, equipment or animals (Watson and Kondo, 2022).

Woody plants for planting are the main pathways of spread of *D. unifasciatus* over long distances.

3.5. Impacts

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

No, there is no recent evidence to suggest that *D. unifasciatus* would have an economic or environmental impact if it established in the EU.

D. unifasciatus is kept under good control by its numerous species of natural enemies and can be considered as of minor importance (Talhouk, 1978; Gerson and Applebaum, 2019). Most of the natural enemies reported for *D. unifasciatus* are present in the EU (e.g. Noyes, 2019) and if *D. unifasciatus* was to establish in the EU, such enemies are likely to keep the scale from becoming a pest of economic or environmental importance.

Nevertheless, early literature from the 1930s noted that in some districts of Uzbekistan, the scale was reported to widely infest peaches and almonds; infested trees could lose foliage and suffer a general weakness; trees could then become more susceptible to other pests (e.g. to borer attacks), they could also wither and die (Arkhangel'skii, 1938; Yakhanto, 1939 in Talhouk, 1975). In Lebanon, Talhouk (1975) observed that the scale was found on peaches and on almonds causing the death of twigs and smaller branches; severe infestation could result in tree death after 2–4 years. However, Talhouk (1975, 1978) and Gerson and Applebaum (2019) noted that host damage only occurred in orchards where there was repeated use of contact pesticides over a number of years in succession. Such pesticide use disrupts natural enemies and reduces their effectiveness. With reduced pesticide usage across the EU such conditions are not expected in the EU.

3.6. Available measures and their limitations

Are there measures available to prevent pest entry, establishment, spread or impacts such that the risk becomes mitigated?

Yes. Although the existing phytosanitary measures identified in Section 3.3.2 do not specifically target *D. unifasciatus*, they mitigate the likelihood of its entry, establishment and spread within the EU (see also Section 3.6.1).

3.6.1. Identification of potential additional measures

Phytosanitary measures (prohibitions) are currently applied to some host plants for planting (see Section 3.3.2).

Additional potential risk reduction options and supporting measures are shown in Sections 3.6.1.1 and 3.6.1.2.

3.6.1.1. Additional potential risk reduction options

Potential additional control measures are listed in Table 5.

Table 5: Selected control measures (a full list is available in EFSA PLH Panel, 2018) for pest entry/establishment/spread/impact in relation to currently unregulated hosts and pathways. Control measures are measures that have a direct effect on pest abundance

Control measure/Risk reduction option (Blue underline = Zenodo doc, Blue = WIP)	RRO summary	Risk element targeted (entry/establishment/spread/impact)
Require pest freedom	Pest free place of production (e.g. place of production and its immediate vicinity is free from pest over an appropriate time period, e.g. since the beginning of the last complete cycle of vegetation, or past two or three cycles). Pest free production site.	Entry/Spread/Impact
Growing plants in isolation	Place of production is insect proof originate in a place of production with complete physical isolation.	Entry/Spread
Managed growing conditions	Used to mitigate likelihood of infestation at origin. Plants collected directly from natural habitats, have been grown, held and trained for at least two consecutive years prior to dispatch in officially registered nurseries, which are subject to an officially supervised control regime.	Entry/Spread
Biological control and behavioural manipulation	This scale has a large number of natural enemies that keep it under control (see Section 3.1.2). In Lebanon, predators were found, namely the coccinellids *Exochomus* sp. and *Chilocorus bipustulatus* (L.), and the larvae of the noctuids, *Eublemma scitula* Ramb and Calymma communimacula, Schiff., whose caterpillars feed voraciously on the eggs and crawlers. Different parasitoid wasps were bred from this scale: *Coccophagus lycimnia* Walker and *C. scutellaris* Dalm. that emerge from young and gravid females, *Microterys sylvius* Dalman and *Metaphycus punctipes* Dalman. Two other species, *Pachyneuron concolor* (Froster) and *Marietta picta* (Andre) also emerged from the adult scale, the last being a hyperparasite on one or more of the above-mentioned parasitic species, while the status of the *Pachyneuron* species is not definitely known (Talhouk, 1975, 1978). Natural enemies were recorded also in newly colonised areas; indeed, in Turkey four parasitoid species *Coccophagus piceae* Erdos, *Coccophagus lycimnia* Walker (Hymenoptera: Aphelinidae), *Microterys hortulanus*	Spread/Impact

Control measure/Risk reduction option (Blue underline = Zenodo doc, Blue = WIP)	RRO summary	Risk element targeted (entry/ establishment/ spread/impact)
	(Erdos), *Metaphycus* sp. near *zebratus* (Mercet) (Hymenoptera: Encyrtidae) and one hyperparasitoid species *Pachyneuron muscarum* (Linnaeus) (Hymenoptera: Pteromalidae) were reared from *D. unifasciatus* (Bolu, 2012). In Iran, *C. lycimnia* was recorded developing on the scale (Abolmasoumi et al., 2009). Where contact insecticides are regularly used, a great reduction in populations of its natural enemies occurs (Talhouk, 1975).	
Chemical treatments on crops including reproductive material	The effectiveness of contact insecticide applications against *D. unifasciatus* may be reduced by the protective wax cover over the scale. The most vulnerable stage are the crawlers. Systemic pesticides could be effective, while contact wide range pesticides might disrupt natural enemies (Talhouk, 1978).	Entry/Establishment/ Spread/Impact
Chemical treatments on consignments or during processing	Use of chemical compounds that may be applied to plants or to plant products after harvest, during process or packaging operations and storage. The relevant treatments addressed in this information sheet are: a) fumigation; b) spraying/dipping pesticides;	Entry/Spread
Physical treatments on consignments or during processing	This control measure deals with the following categories of physical treatments: irradiation/ionisation; mechanical cleaning (brushing, washing); sorting and grading, and; removal of plant parts.	Entry/Spread
Cleaning and disinfection of facilities, tools and machinery	The physical and chemical cleaning and disinfection of facilities, tools, machinery, transport means, facilities and other accessories (e.g. boxes, pots, hand tools).	Spread
Heat and cold treatments	Controlled temperature treatments aimed to kill or inactivate pests without causing any unacceptable prejudice to the treated material itself.	Entry/Spread

3.6.1.2. Additional supporting measures

Potential additional supporting measures are listed in Table 6.

Table 6: Selected supporting measures (a full list is available in EFSA PLH Panel, 2018) in relation to currently unregulated hosts and pathways. Supporting measures are organisational measures or procedures supporting the choice of appropriate risk reduction options that do not directly affect pest abundance

Supporting measure (Blue underline = Zenodo doc, Blue = WIP)	Summary	Risk element targeted (entry/ establishment/ spread/impact)
Inspection and trapping	Inspection is defined as the official visual examination of plants, plant products or other regulated articles to determine if pests are present or to determine compliance with phytosanitary regulations (ISPM 5). The effectiveness of sampling and subsequent inspection to detect pests may be enhanced by including trapping and luring techniques.	Entry/Spread/Impact

Supporting measure (Blue underline = Zenodo doc, Blue = WIP)	Summary	Risk element targeted (entry/ establishment/ spread/impact)
Laboratory testing	Examination, other than visual, to determine if pests are present using official diagnostic protocols. Diagnostic protocols describe the minimum requirements for reliable diagnosis of regulated pests.	Entry/Spread
Sampling	According to ISPM 31, it is usually not feasible to inspect entire consignments, so phytosanitary inspection is performed mainly on samples obtained from a consignment. It is noted that the sampling concepts presented in this standard may also apply to other phytosanitary procedures, notably selection of units for testing. For inspection, testing and/or surveillance purposes the sample may be taken according to a statistically based or a non-statistical sampling methodology.	Entry
Phytosanitary certificate and plant passport	An official paper document or its official electronic equivalent, consistent with the model certificates of the IPPC, attesting that a consignment meets phytosanitary import requirements (ISPM 5) a) export certificate (import) b) plant passport (EU internal trade)	Entry/Spread
Certified and approved premises	Mandatory/voluntary certification/approval of premises is a process including a set of procedures and of actions implemented by producers, conditioners and traders contributing to ensure the phytosanitary compliance of consignments. It can be a part of a larger system maintained by the NPPO in order to guarantee the fulfilment of plant health requirements of plants and plant products intended for trade. Key property of certified or approved premises is the traceability of activities and tasks (and their components) inherent the pursued phytosanitary objective. Traceability aims to provide access to all trustful pieces of information that may help to prove the compliance of consignments with phytosanitary requirements of importing countries.	Entry/Spread
Certification of reproductive material (voluntary/official)	Plants come from within an approved propagation scheme and are certified pest free (level of infestation) following testing; Used to mitigate against pests that are included in a certification scheme.	Entry/Spread
Delimitation of Buffer zones	ISPM 5 defines a buffer zone as 'an area surrounding or adjacent to an area officially delimited for phytosanitary purposes in order to minimise the probability of spread of the target pest into or out of the delimited area, and subject to phytosanitary or other control measures, if appropriate' (ISPM 5). The objectives for delimiting a buffer zone can be to prevent spread from the outbreak area and to maintain a pest-free production place (PFPP), site (PFPS) or area (PFA).	Spread
Surveillance	Surveillance for early detection of outbreaks.	Entry/Spread

3.6.1.3. Biological or technical factors limiting the effectiveness of measures

- *D. unifasciatus* is polyphagous, making the inspections of all consignments, containing hosts from countries where the pest occurs, difficult.
- Limited effectiveness of contact insecticides due to the presence of a protective wax cover on most instars/stages.

3.7. Uncertainty

No key uncertainties were identified.

4. Conclusions

D. unifasciatus does not meet all the criteria that are within the remit of EFSA to assess for this species to be regarded as a potential Union quarantine pest. The criterion on impact is not met (Table 7).

Table 7: 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	Key uncertainties
Identity of the pest (Section 3.1)	The identity of *D. unifasciatus* is established. Taxonomic keys based on morphology of adults exist.	None
Absence/presence of the pest in the EU (Section 3.2)	*D. unifasciatus* is not known to occur in the EU.	None
Pest potential for entry, establishment and spread in the EU (Section 3.4)	*D. unifasciatus* is able to enter, become established and spread within the EU territory especially in the southern EU MS. The main pathways are woody host plants for planting and cut branches.	None
Potential for consequences in the EU (Section 3.5)	There is no recent evidence to suggest that *D. unifasciatus* would have an economic or environmental impact if it established in the EU. The species is expected to be kept below damaging levels by natural enemies and its natural enemies are present in the EU.	None
Available measures (Section 3.6)	There are measures available to prevent entry, establishment and spread of *D. unifasciatus* in the EU. Risk reduction options include inspections, chemical and physical treatments on consignments from infested countries and the production of plants for import in the EU in pest free areas.	None
Conclusion (Section 4)	*D. unifasciatus* does not meet all of the criteria that are within the remit of EFSA to assess for this species to be regarded as a potential Union quarantine pest.	
Aspects of assessment to focus on/scenarios to address in future if appropriate:		

References

Abolmasoumi N, Talebi AA, Rakhshani E and Lotfalizadeh H, 2009. Study on faunistic, biodiversity and host rates of (Hym., Aphelinidae) in some parts of Markazi and Lorestan Provinces, Iran. Journal of Entomological Research, 2, 1–12.

Ben-Dov Y, 1993. A systematic catalogue of the soft scale insects of the world (Homoptera: Coccoidea: Coccidae). Sandhill Crane Press Gainesville, FL. 536 p.

Bolu H, 2012. A new pest on almond tree, the soft scale *Didesmococcus unifasciatus* (Archangelskaya) (Hemiptera: Coccidae) and its new records parasitoids, Turkey. Journal of the Entomological Research Society, 14, 107–114.

Borchsenius NS, 1957. [Subtribe mealybugs and scales (Coccoidea). Soft scale insects Coccidae. Vol. IX.]. Fauna SSSR. Zoologicheskii Institut Akademii Nauk SSSR. N.S. 66: 1-493.

CABI, online. Datasheet 18878 on Didescococcus unifasciatus. CABI Crop Protection Compendium. [Accessed: 30 August 2023].

Çiftçi U and Bolu H, 2021. First records of Coccomorpha (Hemiptera) species in Diyarbakır, Turkey. Journal of Entomological Science, 56, 235–245.

Danzig EM, 1977. Contributions to the scale insect fauna of North and East Mongolia (Homoptera, Coccoidea). Insects of Mongolia, 5, 196–202.

EFSA PLH Panel (EFSA Panel on Plant Health), Jeger M, Bragard C, Caffier D, Candresse T, Chatzivassiliou E, Dehnen-Schmutz K, Gregoire J-C, Jaques Miret JA, MacLeod A, Navajas Navarro M, Niere B, Parnell S, Potting R, Rafoss T, Rossi V, Urek G, Van Bruggen A, Van Der Werf W, West J, Winter S, Hart A, Schans J, Schrader G, Suffert M, Kertesz V, Kozelska S, Mannino MR, Mosbach-Schulz O, Pautasso M, Stancanelli G, Tramontini S, Vos S and Gilioli G, 2018. Guidance on quantitative pest risk assessment. EFSA Journal 2018;16(8):5350, 86 pp. https://doi.org/10.2903/j.efsa.2018.5350

EFSA PLH Panel (EFSA Panel on Plant Health), Bragard C, Baptista P, Chatzivassiliou E, Gonthier P, Jaques Miret JA, Justesen Af, MacLeod A, Magnusson CS, Milonas P, Navas-Cortes JA, Parnell S, Potting R, Reignault PL, Stefani E, Thulke H-H, Van der Werf W, Civera AV, Zappalà L, Lucchi A, Gómez P, Urek G, Bernardo U, Bubici G, Carluccio AV, Chiumenti M, Di Serio F, Fanelli E, Gardi C, Marzachì C, Mosbach-Schulz O and Yuen J, 2022. Scientific Opinion on the commodity risk assessment of *Malus domestica* plants from Türkiye. EFSA Journal 2022;20(5):7301,185 pp. https://doi.org/10.2903/j.efsa.2022.7301

EFSA PLH Panel (EFSA Panel on Plant Health), Bragard C, Baptista P, Chatzivassiliou E, Gonthier P, Jaques Miret JA, Justesen AF, MacLeod A, Magnusson CS, Milonas P, Navas-Cortes JA, Parnell S, Potting R, Reignault PL, Stefani E, Thulke H-H, Van der Werf W, Civera AV, Zappalà L, Lucchi A, Gómez P, Urek G, Bernardo U, Bubici G, Carluccio AV, Chiumenti M, Di Serio F, Fanelli E, Kaczmarek A, Marzachì C, Mosbach-Schulz O and Yuen J, 2023. Scientific Opinion on the commodity risk assessment of *Prunus persica* and *P. dulcis* plants from Türkiye. EFSA Journal 2023;21(1):7735, 212 pp. https://doi.org/10.2903/j.efsa.2023.7735

EFSA Scientific Committee, Hardy A, Benford D, Halldorsson T, Jeger MJ, Knutsen HK, More S, Naegeli H, Noteborn H, Ockleford C, Ricci A, Rychen G, Schlatter JR, Silano V, Solecki R, Turck D, Benfenati E, Chaudhry QM, Craig P, Frampton G, Greiner M, Hart A, Hogstrand C, Lambre C, Luttik R, Makowski D, Siani A, Wahlstroem H, Aguilera J, Dorne J-L, Fernandez Dumont A, Hempen M, Valtue~na Martınez S, Martino L, Smeraldi C, Terron A, Georgiadis N and Younes M, 2017. Scientific Opinion on the guidance on the use of the weight of evidence approach in scientific assessments. EFSA Journal 2017;15(8):4971, 69 pp. https://doi.org/10.2903/j.efsa.2017.4971

EPPO (European and Mediterranean Plant Protection Organization), 2019. EPPO codes. Available online: https://www.eppo.int/RESOURCES/eppo_databases/eppo_codes

EPPO (European and Mediterranean Plant Protection Organization), online. EPPO Global Database. Available online: https://gd.eppo.int

FAO (Food and Agriculture Organization of the United Nations), 2013. ISPM (International Standards for Phytosanitary Measures) 11—Pest risk analysis for quarantine pests. FAO, Rome, 36 pp. Available online: https://www.ippc.int/sites/default/files/documents/20140512/ispm_11_2013_en_2014-04-30_201405121523-494.65%20KB.pdf

FAO (Food and Agriculture Organization of the United Nations), 2021. International Standards for Phytosanitary Measures. ISPM 5 Glossary of phytosanitary terms, FAO, Rome Available online: https://www.fao.org/3/mc891e/mc891e.pdf

García Morales M, Denno BD, Miller DR, Miller GL, Ben-Dov Y and Hardy NB, 2016. ScaleNet: a literature-based model of scale insect biology and systematics. Database. https://doi.org/10.1093/database/bav118

Gerson U and Applebaum S (Eds), 2019. Didesmococcus unifasciatus (Archangelskaya). Plant pests of the Middle East. Available online: https://www.agri.huji.ac.il/mepests/pest/Didesmococcus_unifasciatus/ [Accessed: 15 August 2023]

Griessinger D and Roy A-S, 2015. EPPO codes: a brief description. Available online: https://www.eppo.int/media/uploaded_images/RESOURCES/eppo_databases/A4_EPPO_Codes_2018.pdf

Hodgson CJ, 1994. The scale insect family Coccidae: an identification manual to genera. CAB International Wallingford, Oxon, UK. 639 pp.

Kaydan MB, Kozár F and Atlihan R, 2009. Aspidiotinae and Leucaspidinae (Hemiptera: Diaspididae) species determined in Agri, Bitlis, Hakkari, Igdir and Van provinces. Turkiye Entomoloji Dergisi-Turkish Journal of Entomology, 33, 133–152.

Kaydan MB and Kozár F, 2010. Soft Scale Insect (Hemiptera: Coccoidea) Species of Eastern Anatolia of Turkey. Acta Phytopathologica et Entomologica Hungarica, 45, 195–221.

Moghaddam M, 2013. A review of the mealybugs (Hemiptera: Coccoidea: Pseudococcidae, Putoidae and Rhizoecidae) of Iran, with descriptions of four new species and three new records for the Iranian fauna. Zootaxa, 3632, 001–107.

Noyes JS, 2019. Universal Chalcidoidea Database. World Wide Web electronic publication. Available online: https://www.nhm.ac.uk/chalcidoids

Potaeva AG, 1999. [Didesmococcus unifasciatus Arch. (Homoptera, Coccidae) - new species for the fauna of Turkmenistan.]. Proceedings of the Applied Science Conference 77.

Sayers EW, Cavanaugh M, Clark K, Ostell J, Pruitt KD and Karsch-Mizrachi I, 2020. Genbank. Nucleic Acids Research, 48(Database issue), D84–D86. https://doi.org/10.1093/nar/gkz956

Talhouk AS, 1975. Contributions to the knowledge of almond pests in East Mediterranean countries: II. Didesmococcus unifasciatus (Arch.). Journal of Applied Entomology, 78, 409–414.

Talhouk AS, 1978. Contributions to the knowledge of almond pests in East-Mediterranean countries. VIII. The establishment of an integrated program of almond pest management in Lebanon. Journal of Applied Entomology, 87, 1–14.
Tang FT, 1991. The Coccidae of China. Shanxi United Universities Press, Taiyuan, P. R. China. 377 pp.
Ter-Grigorian T, 1956. [Coccids of cultivated fruit in Armenia.]. Sbornik, Institut Zoologii. Akademiya Nauk Armianskoi SSR (Zoological Papers, Academy of Sciences of Armenian SSR, Zoological Institute), 9, 33–57.
Torabi M, Vahedi HA and Hodgson CJ, 2010. Preliminary survey of the scale insects fauna in Kermanshah, western Iran. Entomologia Hellenica, 19, 153–162.
Toy SJ and Newfield MJ, 2010. The accidental introduction of invasive animals as hitchhikers through inanimate pathways: a New Zealand perspective. Revue scientifique et technique (International Office of Epizootics), 29, 123–133.
Varshney RK, 1992. A check list of the scale insects and mealy bugs of South Asia. Part-1. Records of the Zoological Survey of India, Occasional Paper (No. 139): 1–152.
Watson GW and Kondo T, 2022. Encyclopaedia of scale insect pests. CABI International. 608 pp.

Abbreviations

EPPO	European and Mediterranean Plant Protection Organization
FAO	Food and Agriculture Organization
IPPC	International Plant Protection Convention
ISPM	International Standards for Phytosanitary Measures
MS	Member State
PLH	EFSA Panel on Plant Health
PFA	pest-free production area
PFPP	pest-free production place
PFPS	pest-free production site
PZ	Protected Zone
TFEU	Treaty on the Functioning of the European Union
ToR	Terms of Reference

Glossary

Containment (of a pest)	Application of phytosanitary measures in and around an infested area to prevent spread of a pest (FAO, 2021).
Control (of a pest)	Suppression, containment or eradication of a pest population (FAO, 2021).
Entry (of a pest)	Movement of a pest into an area where it is not yet present, or present but not widely distributed and being officially controlled (FAO, 2021).
Eradication (of a pest)	Application of phytosanitary measures to eliminate a pest from an area (FAO, 2021).
Establishment (of a pest)	Perpetuation, for the foreseeable future, of a pest within an area after entry (FAO, 2021).
Greenhouse	A walk-in, static, closed place of crop production with a usually translucent outer shell, which allows controlled exchange of material and energy with the surroundings and prevents release of plant protection products (PPPs) into the environment.
Hitchhiker	An organism sheltering or transported accidentally via inanimate pathways including with machinery, shipping containers and vehicles; such organisms are also known as contaminating pests or stowaways (Toy and Newfield, 2010).
Impact (of a pest)	The impact of the pest on the crop output and quality and on the environment in the occupied spatial units.
Introduction (of a pest)	The entry of a pest resulting in its establishment (FAO, 2021).
Pathway	Any means that allows the entry or spread of a pest (FAO, 2021).
Phytosanitary measures	Any legislation, regulation or official procedure having the purpose to prevent the introduction or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests (FAO, 2021).
Quarantine pest	A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled (FAO, 2021).

Risk reduction option (RRO)	A measure acting on pest introduction and/or pest spread and/or the magnitude of the biological impact of the pest should the pest be present. A RRO may become a phytosanitary measure, action or procedure according to the decision of the risk manager.
Spread (of a pest)	Expansion of the geographical distribution of a pest within an area (FAO, 2021).

Appendix A – *Didesmococcus unifasciatus* host plants/species affected

Source: CABI CPC (CABI, online), Garcia Morales et al. (2016) (ScaleNet) and literature

Host status	Host name	Plant family	Common name	Reference
Cultivated hosts	*Ficus carica*	Moraceae	Common fig	Ter-Grigorian (1956), Garcia Morales et al. (2016)
	Malus domestica	Rosaceae	Apple	Torabi, et al. (2010), Garcia Morales et al. (2016)
	Prunus amygdalus (=*Prunus dulcis; Amygdalus communis*)	Rosaceae	Almond	Moghaddam (2013), Garcia Morales et al. (2016), Bolu (2012), Çiftçi and Bolu (2021), Danzig (1977)
	Prunus persica (*Prunus vulgaris*)	Rosaceae	Peach	Bolu (2012), Çiftçi and Bolu (2021)
	Prunus prostrata (=*Prunus concolor*)	Rosaceae	Mountain cherry	Hodgson (1994), Garcia Morales et al. (2016)
	Prunus scoparia (=*Amygdalus scoparia*)	Rosaceae	–	Torabi, et al. (2010), Garcia Morales et al. (2016)
	Prunus tenella (= Amygdalus nana)	Rosaceae		Garcia Morales et al. (2016)
	Prunus pedunculata (= *Amygdalus pedunculata)*	Rosaceae	Russian dwarf almond	Borchsenius (1957), Garcia Morales et al. (2016)
	Pseudocydonia sinensis (=*Chaenomeles sinensis; Cydonia vulgaris)*	Rosaceae	Chinese quince	Varshney (1992), Garcia Morales et al. (2016)
	Ulmus	Ulmaceae	–	Potaeva (1999), Garcia Morales et al. (online)
Wild weed hosts	–			
Artificial/ experimental host	–			

Appendix B – Distribution of *Didesmococcus unifasciatus*

Distribution records based on CABI CPC (CABI, online) and Garcia Morales et al. (2016) (ScaleNet)

Region	Country	Sub-national (e.g. State)	Status	References
Asia	Afghanistan		Present, no details	Garcia Morales et al. (2016)
	Armenia		Present, no details	CABI (online)
	China	Inner Mongolia	Present, no details	Garcia Morales et al. (2016)
	Iran		Present, no details	CABI (online)
	Lebanon		Present, no details	CABI (online)
	Mongolia		Present, no details	Garcia Morales et al. (2016)
	Pakistan		Present, no details	Rao (1939), Garcia Morales et al. (2016)
	Tajikistan		Present, no details	Ben Dov (1993), Garcia Morales et al. (2016)
	Türkiye	Hakkari	Present, no details	Kaydan and Kozar (2010)
		Diyarbakir	Present, no details	Bolu (2012), Çiftçi and Bolu (2021), Garcıa Morales et al. (2016)
	Turkmenistan		Present, no details	Potaeva (1999), Garcia Morales et al. (2016)
	Uzbekistan		Present, no details	CABI (online)