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Pest categorisation of *Icerya aegyptiaca*

EFSA Panel on Plant Health (PLH),
Claude Bragard, Paula Baptista, Elisavet Chatzivassiliou, Francesco Di Serio, Paolo Gonthier, Josep Anton Jaques Miret, Annemarie Fejer Justesen, Christer Sven Magnusson, Panagiotis Milonas, Juan A Navas-Cortes, Stephen Parnell, Roel Potting, Philippe Lucien Reignault, Emilio Stefani, Hans-Hermann Thulke, Wopke Van der Werf, Antonio Vicent Civera, Jonathan Yuen, Lucia Zappalà, Jean-Claude Grégoire, Chris Malumphy, Antigoni Akrivou, Virag Kertesz, Dimitrios Papachristos and Alan MacLeod

Abstract

The EFSA Panel on Plant Health performed a pest categorisation of *Icerya aegyptiaca* (Hemiptera: Sternorrhyncha: Monophlebidae), the Egyptian fluted scale, for the EU. This insect is established in several countries in tropical and subtropical regions of the world. Within the EU, the pest has not been reported. It is not listed in Annex II of Commission Implementing Regulation (EU) 2019/2072. It is highly polyphagous, feeding on plants in 128 genera and 66 families, with some preference for avocado (*Persea americana*), banana (*Musa* sp.), citrus (*Citrus* spp.), coconut (*Coccos nucifera*), common pear (*Pyrus communis*), fig (*Ficus* spp.), guava (*Psidium guajava*), maize (*Zea mays*), mango (*Mangifera indica*), white mulberry (*Morus alba*), and grapevine (*Vitis vinifera*). It has also been recorded feeding on tomato (*Solanum lycopersicum*), as well as on ornamental plants. Plants for planting and fruits, vegetables and cut flowers are the main potential pathways for entry of *I. aegyptiaca* into the EU. Climatic conditions and availability of host plants in parts of the EU where there are very few days of frost each year would likely allow this species to successfully establish and spread. Economic impact in cultivated hosts including citrus, grapes, maize, peppers, sunflowers, tomatoes and ornamental crops is anticipated if establishment occurs. Phytosanitary measures are available to reduce the likelihood of entry and spread. *I. aegyptiaca* meets the criteria that are within the remit of EFSA to assess for this species to be regarded as a potential Union quarantine pest.

Keywords: breadfruit mealybug, Hemiptera, Monophlebidae, pest risk, plant health, plant pest, quarantine

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Correspondence: plants@efsa.europa.eu

Panel members: Claude Bragard, Paula Baptista, Elisavet Chatzivassiliou, Francesco Di Serio, Paolo Gonthier, Josep Anton Jaques Miret, Annemarie Fejer Justesen, Alan MacLeod, Christer Sven Magnusson, Panagiotis Milonas, Juan A Navas-Cortes, Stephen Parnell, Roel Potting, Philippe L Reignault, Emilio Stefani, Hans-Hermann Thulke, Wopke Van der Werf, Antonio Vicent Civera, Jonathan Yuen and Lucia Zappalà.

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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

Icerya aegyptiaca fits the criteria stipulated in Annex 1C of the Terms of Reference (ToRs) 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 assessment of fig (*Ficus carica*) and avocado (*Persea americana*) plants for planting from Israel performed by the EFSA Plant Health Panel (EFSA PLH Panel, 2021a,b), in which *I. aegyptiaca* was identified as a relevant non-regulated EU pest which could potentially enter the EU on *F. carica* and *P. americana*.

2. Data and methodologies

2.1. Data

2.1.1. Literature search

A literature search on *I. aegyptiaca* 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 (Phyto-Sanitary 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 *I. aegyptiaca* 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 *I. aegyptiaca*, following guiding principles and steps presented in the EFSA guidance on quantitative pest risk assessment (EFSA PLH Panel et al., 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. While 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 et al., 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 *Icerya aegyptiaca* (Douglas) is the accepted name.

Icerya aegyptiaca (Douglas, 1890) (Figure 1) is a scale insect within the order Hemiptera, suborder Sternorrhyncha, family Monophlebidae. It is commonly known as Egyptian fluted scale, Egyptian mealybug, and breadfruit mealybug (EPPO, online; CABI, online). *I. aegyptiaca* was originally described from an Egyptian specimen as *Crossotosoma aegyptiacum* Douglas, 1890. It was later transferred by Riley and Howard (1890) to the genus *Icerya* as *I. aegyptiacum* (Douglas), and later, Maskell (1893) amended the name to the current *I. aegyptiaca* (Douglas). *Icerya tangalla* (Green, 1896), described from specimens collected in Sri Lanka, is a synonym of *I. aegyptiaca* (García Morales et al., 2016).

The EPPO code[1] (Griessinger and Roy, 2015; EPPO, 2019) for this species is: ICERAE (EPPO, online).

Figure 1: *Icerya aegyptiaca*: adult females (body length about 5 mm) and colonies along the leaf veins (Source: Chris Malumphy)

3.1.2. Biology of the pest

I. aegyptiaca is parthenogenetic and males have never been found (García Morales et al., 2016). There are five life stages: egg, three nymphal instars, which develop for between 11 and 35 days per instar, and adult (García Morales et al., 2016; MAF, 2009). Depending on temperature, the duration of the life cycle ranges from 87.2 (at 28.7°C) to 105.4 days (at 26.4°C), and it can be found on foliage and stems all year round. Environmental conditions and host plants affect development rate. There can be two or three generations per year (Waterhouse, 1991; García Morales et al., 2016). For example, in Egypt, two generations on *Ficus virens*; nymphs of the first generation occur in early May while that of the second generation occurs in early October (Emam, 2015). The peak number of adults is observed during the summer (Waterhouse, 1991, 1993). Females lay from 70 up to 200 yellow-orange eggs. They are laid into a waxy egg sac, attached to the abdomen. The egg sac is ruptured by first-instar nymphs. No thermal thresholds have been defined although low relative humidity and temperature result in slower development rates over the winter season in Bangladesh (Hardy et al., 2009). Important features of the life history strategy of *I. aegyptiaca* are presented in Table 2.

[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).

Table 2: Important features of the life history strategy of *Icerya aegyptiaca*

Life stage	Phenology and relation to host	Other relevant information
Egg	Eggs of *I. aegyptiaca* are laid into a waxy egg sac attached ventrally to the tip of the abdomen (Waterhouse, 1991).	Eggs hatch after 1–17 days. The oviposition period lasts up to 49 days (MAF, 2009).
Nymph	Hatching first instars, known as 'crawlers', settle along the midribs and larger veins on the underside of leaves and on the fruits after a day and become covered in wax that they produce.	
Adult	In croton plants (*Codiaeum variegatum*) I. *aegyptiaca* adults are found mostly on adaxial surface aggregating on the mid rib (Waterhouse, 1991) and covered with waxy secretion and spread to the petioles of the leaves when there is heavy infestation (Akintola et al., 2013). In Egypt, preovipositing females on *Ficus virens* appear in early June and in mid-October.	Ovipositing females of the first generation start to appear in early January with highest number in mid-June and that of the second generation in mid-November (Emam, 2015)

3.1.3. Host range/species affected

The host range of *I. aegyptiaca* is broad with more than 128 plant genera in 66 plant families (Appendix A provides a full host list). The host range of *I. aegyptiaca* includes plant species cultivated in the EU such as avocado (*Persea americana*), banana (*Musa* sp.), citrus (*Citrus* spp.), common pear (*Pyrus communis*), fig (*Ficus* spp.), guava (*Psidium guajava*), maize (*Zea mays*), mango (*Mangifera indica*), white mulberry (*Morus alba*), roses (*Rosa* spp.), Chinese rose (*Hibiscus rosa-sinensis*), thuja (*Thuja* sp.), tomato (*Solanum lycopersicum*), grapevine (*Vitis vinifera*) and many more (CABI, online; EPPO, online; García Morales et al., 2016).

3.1.4. Intraspecific diversity

No intraspecific diversity has been reported for *Icerya aegyptiaca*.

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 and molecular identification methods are available.

Detection

Infestations of *I. aegyptiaca* are highly conspicuous and usually easily detected due to their gregarious nature and large quantities of white wax produced (Figure 1). They occur on the lower surfaces of the foliage or on the stems. Therefore, visual examination of plants is an effective way for the detection of *I. aegyptiaca*. Accumulation of honeydew, sooty mould and honeydew-seeking ants are general signs of phloem feeding insect infestations (Camacho and Chong, 2015). Plant damage might not be obvious in early infestation, but the presence of individuals on the plants can be observed because of the white wax cover. Sticky traps can be used to detect crawlers (Bethke and Wilen, 2010).

Symptoms

According to Akintola et al. (2013), CABI (online), Uesato et al. (2011), the main symptoms of *I. aegyptiaca* infestation are:

- honeydew egested by the scales;
- black sooty mould growing on the honeydew;
- leaf surfaces covered with abundant white wax;
- leaf curling, and;

- heavy infestation causes yellowing, defoliation, reduced plant growth, dieback of the branches or of the entire plant;
- ant presence.

These symptoms are similar to those caused by many other plant-sap feeding insects and should not be considered as diagnostic.

Identification

The identification of *I. aegyptiaca* requires microscopic examination of slide-mounted female adults and verification of the presence of key morphological characteristics. Detailed morphological descriptions, illustrations, and keys of adult *I. aegyptiaca* females and other species of the scale insect tribe Iceryini can be found in Unruh and Gullan (2008).

Molecular techniques based on the nucleotide sequences of the mitochondrial cytochrome c oxidase subunits I and II (COI) genes have been developed for species identification. GenBank contains gene nucleotide sequences for *I. aegyptiaca* (https://www.ncbi.nlm.nih.gov/nuccore/AB439512.1).

Description

The eggs of *I. aegyptiaca* are oval, yellowish orange. Hatching first instars are orange and active, known as 'crawlers'. They settle down after a day and become covered in wax that they produce. There are two more moults to the second and third instar nymphs which are yellow to orange, covered in a white mealy wax, and have 21 white waxy processes, about 2.5 mm long, around their bodies (Waterhouse, 1993). The body of the adult female is oval, up to 5.3 mm long and 3.8 mm wide (Unruh and Gullan, 2008; Beshr, 2015). It is orange red or brick red, with black legs and antennae, the dorsum almost completely covered with cushions of white mealy secretion intermingled with pulverulent or granular wax (García Morales et al., 2016).

3.2. Pest distribution

3.2.1. Pest distribution outside the EU

I. aegyptiaca occurs in tropical and subtropical countries in Africa, south Asia and Oceania (CABI, online; EPPO, online) (Figure 2). For a detailed list of countries where *I. aegyptiaca* is present, see Appendix B.

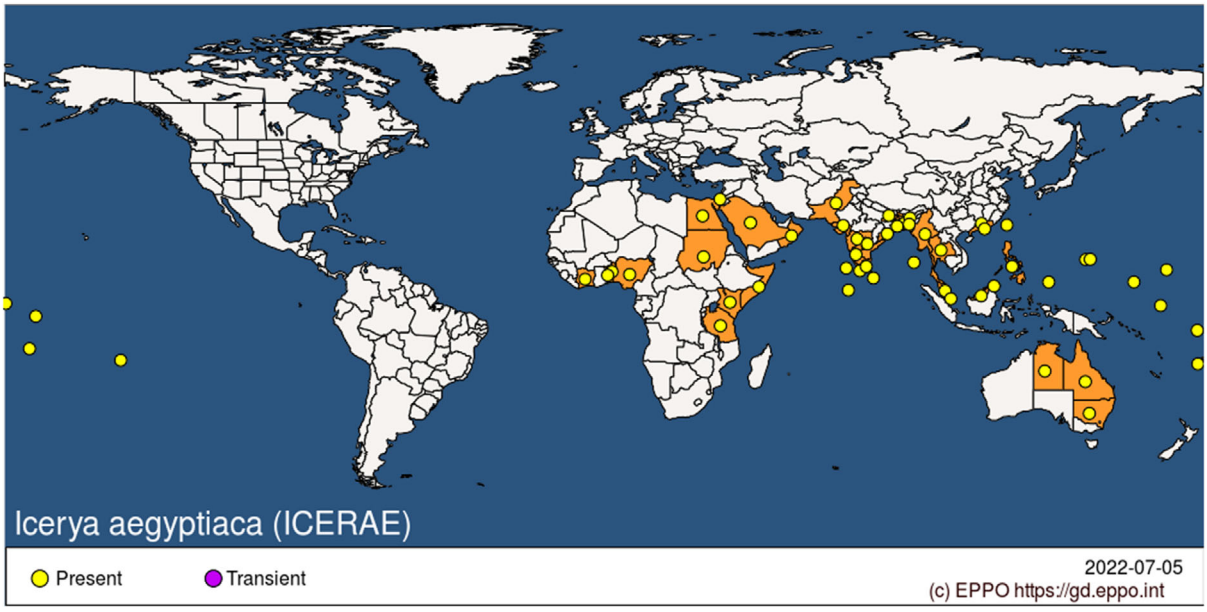

Figure 2: Global distribution of *Icerya aegyptiaca* (Source: EPPO Global Database accessed on 7 May 2022)

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. *I. aegyptiaca* is not known to occur in the EU.

3.3. Regulatory status

3.3.1. Commission implementing regulation 2019/2072

I. aegyptiaca is not listed in Annex II of Commission Implementing Regulation (EU) 2019/2072, an implementing act of Regulation (EU) 2016/2031. However, the species is included in the list of pests that are regulated by the Commission Implementing Regulation (EU) 2020/1213 (as amended by 2021/1936) as regards certain plants for planting of *Ficus carica* L. and *Persea americana* Mill. originating in Israel.

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

According to the Commission Implementing Regulation (EU) 2019/2072, Annex VI, introduction of several *I. aegyptiaca* hosts in the Union from certain third countries is prohibited (Table 3).

Plants for planting of *Annona* L., *Diospyros* L., *Ficus* L., *Prunus* L., and *Salix* L., which are hosts of *I. aegyptiaca* (Appendix A) are considered High Risk Plants for the EU and their import is prohibited pending risk assessment (EU 2018/2019).

Table 3: List of plants, plant products and other objects that are *Icerya aegyptiaca* 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., *Pyrus* L. and *Rosa* L., other than dormant plants free from leaves, flowers and fruits	ex 0602 10 90 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 ex 0602 90 70 ex 0602 90 91 ex 0602 90 99	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, Serbia, Switzerland, Türkiye, Ukraine and the United Kingdom.
9.	Plants for planting of [. . .], *Malus* Mill., *Prunus* L. and *Pyrus* L. and their hybrids, and [. . .], other than seeds	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

10.	Plants of *Vitis* L., other than fruits	0602 10 10 0602 20 10 ex 0604 20 90 ex 1,404 90 00	Third countries other than Switzerland
11.	Plants of [. . .], *Fortunella* Swingle, *Poncirus* Raf., and their hybrids, other than fruits and seeds	ex 0602 10 90 ex 0602 20 20 0602 20 30 ex 0602 20 80 ex 0602 90 45 ex 0602 90 46 ex 0602 90 47 ex 0602 90 50 ex 0602 90 70 ex 0602 90 91 ex 0602 90 99 ex 0604 20 90 ex 1,404 90 00	All third countries
14.	Plants for planting of the family *Poaceae*, other than [. . .], other than seeds	ex 0602 90 50 ex 0602 90 91 ex 0602 90 99	Third countries other than: Albania, Algeria, Andorra, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Canary Islands, Egypt, Faeroe Islands, Georgia, Iceland, Israel, Jordan, Lebanon, Libya, Liechtenstein, Moldova, Monaco, Montenegro, Morocco, 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 and the United Kingdom
18.	Plants for planting of *Solanaceae* other than seeds and the plants covered by entries 15, 16 or 17	ex 0602 10 90 ex 0602 90 30 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, Azerbaijan, Belarus, Bosnia and Herzegovina, Canary Islands, Egypt, Faeroe Islands, Georgia, Iceland, Israel, Jordan, Lebanon, Libya, Liechtenstein, Moldova, Monaco, Montenegro, Morocco, 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 and the United Kingdom

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. *I. aegyptiaca* could enter the EU territory. Possible pathways of entry are plants for planting, fruits, vegetables and cut flowers.

Comment on plants for planting as a pathway.

Plants for planting provide one of the main pathways for *I. aegyptiaca* to enter the EU (Table 4).

Plants for planting and fruits, vegetables and cut flowers are the main potential pathways for entry of *I. aegyptiaca* (Table 4).

Table 4: Potential pathways for *Icerya aegyptiaca* into the EU 27

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]
Plants for planting	All life stages	Plants for planting that are hosts of *I. aegyptiaca* and are prohibited from certain/all 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
Fruits, vegetables and cut flowers	All life stages	Fruits, vegetables and cut flowers from third countries require a phytosanitary certificate to be imported into the EU (2019/2072, Annex XI, Part A). However, no requirements are specified for *I. aegyptiaca*.

Annual import data of *I. aegyptiaca* hosts from countries where the pest is known to occur are provided in Appendix C.

Notifications of interceptions of harmful organisms began to be compiled in Europhyt in May 1994 and in TRACES in May 2020. As at May 2022, there were no records of interception of *I. aegyptiaca* in the Europhyt and TRACES databases.

Between 1995 and 2012, *I. aegyptiaca* was intercepted eight times in the United States on a variety of hosts, with specimens originating from Egypt, Israel, Malaysia, Nigeria, The Philippines, Singapore, Syrian Arab Republic, and Thailand (Miller et al., online).

3.4.2. Establishment

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

Yes. Areas of the EU with very few frost days provide suitable environmental conditions (climate and hosts) for the establishment of *I. aegyptiaca*. Establishment outdoors in central and northern Europe is very unlikely although it could occur in greenhouses.

3.4.2.1. EU distribution of main host plants

I. aegyptiaca is a polyphagous pest. The main hosts of the pest cultivated in the EU 27 between 2016 and 2020 are shown in Table 5. Among others, citrus, grapes, maize, peppers, sunflower, tomatoes and ornamental plants are important crops in the EU.

Table 5: Crop area of *Icerya aegyptiaca* key hosts in EU 27 in 1000 ha (Eurostat accessed on 5/7/2022)

Crop	Eurostat code	2016	2017	2018	2019	2020
Green maize	G3000	6,061.45	5,985.90	6,134.91	6,210.36	6,325.72
Grapes	W1000	3,136.15	3,133.32	3,135.50	3,155.20	3,156.21
Citrus	T0000	519.01	502.84	508.99	512.83	519.98
Tomatoes	V3100	253.95	247.95	239.48	242.52	233.20
Pears	F1130	115.13	113.81	113.54	110.66	107.79
Peppers	V3600	59.95	59.50	58.92	59.60	57.41
Figs	F2100	23.74	24.63	24.99	25.59	27.23

There is a derogation for *Ficus carica* ((EU) 2020/1213) and for *Persea americana* (Regulation (EU) 2021/1936) plants coming from Israel. A commodity risk assessment for *F. carica* plants for planting from Israel, indicated with 95% certainty, that between 98.55% and 100% of imported plants would be free from *I. aegyptiaca* (EFSA, 2021a). A commodity risk assessment for *P. americana* plants for planting from Israel, indicated with 95% certainty, that between 99.81% and 99.99% of imported grafted plants would be free from mealybugs and soft scales including *I. aegyptiaca* (EFSA, 2021b).

3.4.2.2. Climatic conditions affecting establishment

I. aegyptiaca occurs mainly in tropical and subtropical regions in Asia, Africa and Oceania. It has been present in Egypt for more than a hundred years. 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 3 shows the world distribution of Köppen-Geiger climate types (Kottek et al., 2006) that occur in the EU, and which occur in countries where *I. aegyptiaca* has been reported. Southern EU countries may provide suitable climatic conditions for the establishment of *I. aegyptiaca*. As a tropical and subtropical organism, low temperatures, as indicated by frost, may limit establishment. Figure 4 shows frost free areas in EU which could perhaps be colonised by *I. aegyptiaca*. Data for Figure 4 represents the 30-year period 1988–2017 and was sourced from the Climatic Research Unit high resolution gridded data set CRU TS v. 4.03 at 0.5° resolution (https://crudata.uea.ac.uk/cru/data/hrg/).

Establishment outdoors in central and northern Europe is very unlikely. Nevertheless, there is a possibility that *I. aegyptiaca* could occur in greenhouses and on indoor plantings in such areas.

Liu and Shi (2020) used the MaxEnt software and provide a map predicting potential global distribution of *I. aegyptiaca*. Under current climate conditions they identify parts of Europe as far north as the north of England as being of moderate habitat suitability. However, some areas where *I. aegyptiaca* is known to occur are identified as being of low habitat suitability, for example most of Egypt. Liu and Shi (2020) largely based their prediction on data from Asia, and do not accurately reflect the current distribution around the Mediterranean.

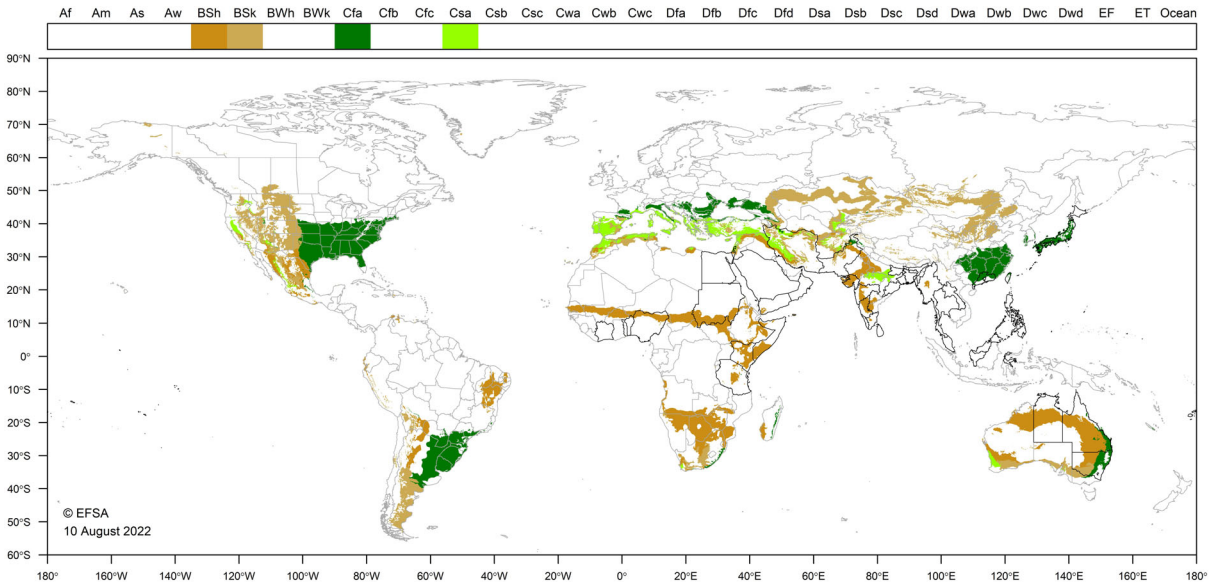

Figure 3: World distribution of Köppen–Geiger climate types that occur in the EU and which occurin countries where *Icerya aegyptiaca* has been reported

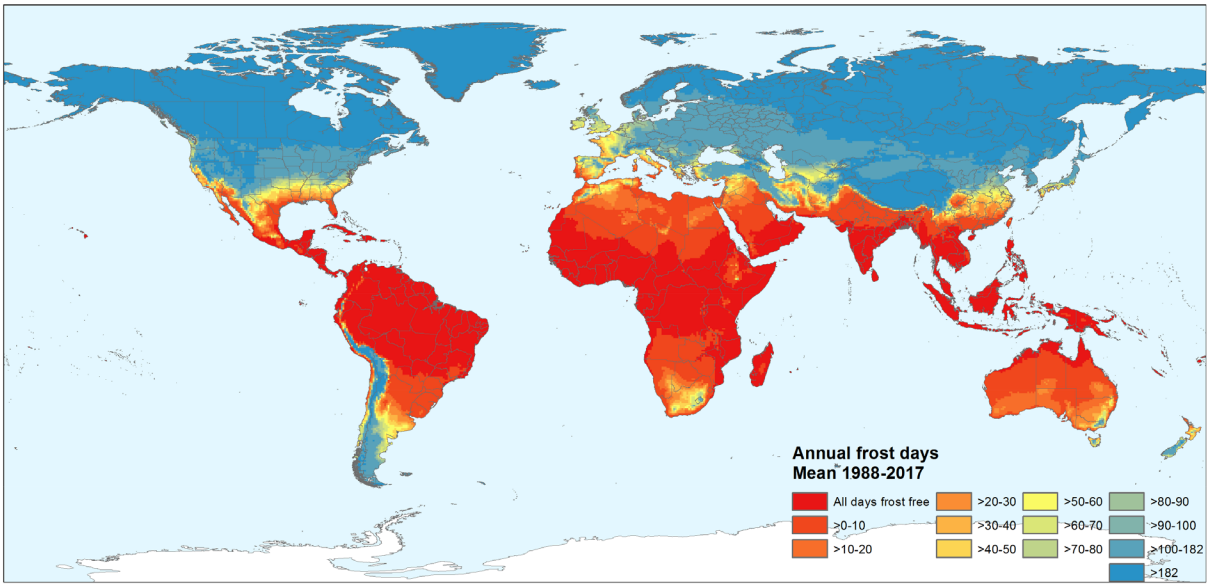

Figure 4: Annual frost days in the world (mean 1988–2017) (source: Climatic Research Unit, University of East Anglia, UK)

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, fruits, vegetables, and cut flowers.

Comment on plants for planting as a mechanism of spread.

Plants for planting provide a main spread mechanism for *I. aegyptiaca* over long distances.

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

Plants for planting, fruits, vegetables and cut flowers are the main pathways of spread of *I. aegyptiaca* over long distances.

3.5. Impacts

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

Yes, if *I. aegyptiaca* established in the EU, it would most probably have an economic impact.

I. aegyptiaca, when abundant, causes defoliation and in some cases dieback of the branches and the entire plant (Uesato et al., 2011). It also egests honeydew which induces sooty blotch that covers leaf surface and, make fruits unmarketable (Liu and Shi, 2020). However, in Japan, *I. aegyptiaca* is found to egest little to no honeydew and, this monophlebid species is rarely associated with sooty mould, (Uesato et al., 2011; Helmy, 2021). In Kiribati and some other Micronesian atolls, the greatest impact of *I. aegyptiaca* is on the breadfruit tree (*Artocarpus altilis*) with crop loss as high as 50% or more (Waterhouse, 1991). In Chahbahar, Iran, *I. aegyptica* caused considerable damage on mango (*Mangifera indica*) and tropical fruits. In China, *I. aegyptiaca* was listed as one of the dangerous garden pests (Liu and Shi, 2020).

I. aegyptiaca has been recorded as a serious pest of citrus, fig and shade trees in Egypt, although it is largely controlled by natural enemies (Clausen, 1978). It is also recorded as a pest of commercial rose production in greenhouses in Egypt (Samia and Emam, 2020). It is a pest of breadfruit, avocado, banana, citrus, and ornamentals in the South Pacific, of annona, jackfruit, sapote (*Pouteria sapota*), mulberry and guava in India, and breadfruit in the Maldives Islands (García Morales et al., 2016).

There seem to be suitable areas in the EU, where *I. aegyptiaca* could become abundant and harmful.

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 *I. aegyptiaca*, 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 6.

Table 6: 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 2 or 3 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	It is reported that *I. aegyptiaca* populations have been significantly reduced by *Chrysopa* spp., in the Marshall Islands, Fais Island, at Lae Atoll, and Egypt (Beardsley, 1955; Helmy, 2021). *Harmonia arcuate*, *Coelophora inaequalis*, Cryptolaemus montrouzieri, *Nephus includens*, and *Steatococcus samaraius* were found attacking this species (Beardsley, 19,559; Abdel-Salam et al., 2010). *Rodolia cardinalis* found to be an effective predator of *I. aegyptiaca* in Egypt (Ragab, 1995; Ghanim et al., 2013; Awadalla and Ghanim, 2016; Helmy, 2021).	Spread/Impact
Chemical treatments on crops including reproductive material	The effectiveness of insecticide applications against *I. aegyptiaca* may be reduced by the protective wax cover. The efficacy of mineral oils, insect growth regulators and organophosphorus insecticides was tested on ornamental plants (Mangoud and Abd El-Gawad, 2003; Abdel-Fattah et al., 2016; Zhou et al., 2022).	Entry/Establishment/Spread/Impact

Control measure/Risk reduction option (Blue underline = Zenodo doc, Blue = WIP)	RRO summary	Risk element targeted (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 information sheet 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, 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 7.

Table 7: 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
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

Supporting measure (Blue underline = Zenodo doc, Blue = WIP)	Summary	Risk element targeted (entry/establishment/ spread/impact)
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

- *I. aegyptiaca* 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 protective wax cover

3.7. Uncertainty

No key uncertainties of the assessment have been identified.

4. Conclusions

Icerya aegyptiaca satisfies all the criteria that are within the remit of EFSA to assess for it to be regarded as a potential Union quarantine pest (Table 8).

Table 8: 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 *I. aegyptiaca* is established. Taxonomic keys based on morphology of adults exist. There are also molecular techniques for species identification.	None
Absence/presence of the pest in the EU (Section 3.2)	No, *I. aegyptiaca* is not known to occur in the EU.	None
Pest potential for entry, establishment and spread in the EU (Section 3.4)	*Icerya aegyptiaca* is able to enter, become established and spread within the EU territory especially in the southern EU MS. The main pathways are plants for planting, cut flowers, fruits, and vegetables.	None
Potential for consequences in the EU (Section 3.5)	The introduction of the pest could cause yield and quality losses on several crops and reduce the value of ornamental plants.	None
Available measures (Section 3.6)	There are measures available to prevent entry, establishment and spread of *I. aegyptiaca* in the EU. Risk reduction options include inspections, chemical and physical treatments on consignments of fresh plant material from infested countries and the production of plants for import in the EU in pest free areas.	None
Conclusion (Section 4)	*I. aegyptiaca* satisfies all the criteria that are within the remit of EFSA to assess for it to be regarded as a potential Union quarantine pest	
Aspects of assessment to focus on/scenarios to address in future if appropriate:		

References

Abdel-Fattah RS, Hanaa Hussein S, Beshr SM and Abo-Shanab AS, 2016. Efficacy of some insecticides on Mortality and Enzyme Activity of Egyptian mealybug (*Icerya aegyptiaca* Douglas) Attacking *Lantana camara* L. in Alexandria, Egypt. Egyptian Scientific Journal of Pesticides, 3, 1–7.

Abdel-Salam A, Ghanim A and Awadalla H, 2010. Biological attributes and life table parameters of *Nephus includens* (Kirsch) (Coleoptera: Coccinellidae) as a natural enemy of margarodid mealybugs in Egypt. Journal of Plant Protection and Pathology, 1, 51–62. https://doi.org/10.21608/jppp.2010.86656

Akintola AJ, Oyegoke OO and Ikusebiala IM, 2013. Morphometry and preferred feeding site of Egyptian mealybug (*Icerya aegyptiaca* Douglas) on croton *Codiaeum variegatum* plant. International Journal of Applied Agriculture and Apiculture Research, 9, 1–2.

Awadalla H and Ghanim A, 2016. Population density of the main mealybug species attacking mango trees and their associated predatory insects at Mansoura region. Journal of Plant Protection and Pathology, 7, 31–40. https://doi.org/10.21608/jppp.2016.50053

Beardsley JJW, 1955. Fluted scales and their biological control in United States administered Micronesia. Proceedings of the Hawaiian Entomological Society XV, 15, 391–399.

Beshr SM, 2015. Scanning Electron Microscopy of *Icerya aegyptiaca* (Douglas, 1890) (Hemiptera: Monophlebidae). Alexandria Science Exchange Journal, 36, 365–372. https://doi.org/10.21608/asejaiqjsae.2015.2951

Bethke JA and Wilen CA, 2010. UC IPM Pest Management Guidelines: Floriculture and Ornamental Nurseries, UC ANR Publication 3392. Available from: https://www2.ipm.ucanr.edu/agriculture/floriculture-and-ornamental-nurseries/Soft-scales/

CABI (Centre for Agriculture and Biosciences International), online. Datasheet report for *Icerya aegyptiaca* (breadfruit mealybug). Available online: https://www.cabi.org/cpc/datasheet/28426 [Accessed 05 July 2022].

Camacho ER and Chong JH, 2015. General Biology and Current Management Approaches of Soft Scale Pests (Hemiptera: Coccidae). Journal of Integrated Pest Management, 6(1), 17. https://doi.org/10.1093/jipm/pmv016

Clausen CP, 1978. Introduced Parasites and Predators of Arthropod Pests and Weeds: a World Review. Agricultural Handbook No. 480. Agricultural Research Service, United States Department of Agriculture, Washington DC, USA.

EFSA PLH Panel (EFSA Panel on Plant Health), Bragard C, Dehnen-Schmutz K, Di Serio F, Jacques M-A, Anton J, Jaques Miret JA, Justesen AF, MacLeod AF, Magnusson CS, Milonas P, Navas-Cortes JA, Parnell S, Potting R, Reignault PL, Thulke H-H, Van der Werf W, Civera AV, Yuen J, Zappalà L, Battisti A, Mass H, Rigling D, Mosbacher- Schulz O, and Gonthier P, 2021a. Scientific Opinion on the commodity risk assessment of *Ficus carica* plants from Israel. EFSA Journal 2021;19(1):6353, 249 pp. https://doi.org/10.2903/j.efsa.2021.6353

EFSA PLH Panel (EFSA Panel on Plant Health), Bragard C, Dehnen-Schmutz K, Di Serio F, Gonthier P, Jacques M-A, Jaques Miret JA, Justesen AF, MacLeod AF, Magnusson CS, Milonas P, Navas-Cortes JA, Parnell S, Potting R, Reignault PL, Thulke H-H, Van der Werf W, Civera AV, Zappalà L, Gomez P, Lucchi A, Urek G, Tramontini S, Mosbach-Schulz O, de la Peña E and Yuen J, 2021b. Scientific Opinion on the commodity risk assessment of *Persea americana* from Israel. EFSA Journal 2021;19(2):6354, 195 pp. https://doi.org/10.2903/j.efsa.2021.6354

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. Available online: https://doi.org/10.2903/j.efsa.2018.5350

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, Valtueña 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

Emam AS, 2015. Ecological studies on the egyptian mealybug, *Icerya aegyptiaca* (douglas) infesting the ornamental trees, *Ficus virens* Ait. Egyptian Journal of Agricultural Research, 93(4), 1167–1182. https://doi.org/10.21608/EJAR.2015.157008

EPPO (European and Mediterranean Plant Protection Organization), online. EPPO Global Database. Available online: https://gd.eppo.int [Accessed 7 May 2022].

EPPO. 2019. EPPO codes. https://www.eppo.int/RESOURCES/eppo_databases/eppo_codes

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. https://www.fao.org/3/mc891e/mc891e.pdf Griessinger D and Roy A-S, 2015. EPPO codes: a brief description. https://www.eppo.int/media/uploaded_images/RESOURCES/eppo_databases/A4_EPPO_Codes_2018.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 (Oxford), 2016, 1–5. https://doi.org/10.1093/database/bav118

Ghanim A, Abdel-Salam AH, Elkady HA, El-Nagar ME and Awadalla HS 2013. Effect of different mealybug species as preys on some biological characters and predaceous efficiency of the coccinellid predator *Rodolia cardinalis* (mulsant) (Coleoptera: Coccinellidae) under laboratory conditions. Journal of Plant Protection and Pathology, 4, 293–301.

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

Hardy C, Anthony D and Sathyapala S, 2009. Import risk analysis: fresh coconut (*Cocos nucifera*) from Tuvalu. MAF Biosecurity, New Zealand, Wellington, NZ. 138 p.

Helmy S, 2021. Seasonal Abundance of *Icerya aegyptiaca* (Douglas) on Mandarin Trees and its Associated Predators at Giza Governorate. Journal of Plant Protection and Pathology, 12, 125–129. https://doi.org/10.21608/jppp.2021.154399

Kottek M, Grieser J, Beck C, Rudolf B and Rubel F, 2006. World map of the Köppen_Geiger climate classification updated. Meteorologische Zeitschrift, 15, 259–263. https://doi.org/10.1127/0941-2948/2006/0130

Kondo T and Watson GW eds., 2022. Encyclopedia of Scale Insect Pests. CABI International. 608 p.

Liu Y and Shi J, 2020. Predicting the potential global geographical distribution of two *Icerya* species under climate change. Forests, 11, 684. https://doi.org/10.3390/F11060684

AAH M and El-Gawad A, 2003. Evaluation of different integrated pest management concepts for controlling the egyptian fluted mealybug, *Icerya aegyptiaca* on ornamental plants. Bulletin of the Entomological Society of Egypt: Economic series, 29, 137–149.

Miller D, Rung A, Parikh G, Venable G, Redford AJ, Evans GA and Gill RJ, 2022. online. Scale insects, *Icerya aegyptiaca*. Available online: http://www.idtools.org/id/scales/factsheet.php?name=6952

Ragab ME, 1995. Adaptation of *Rodolia cardinalis* (Mulsant) (Col., Coccinellidae) to *Icerya aegyptiaca* (Douglas) (Hom., Margrodidae) as compared with *Icerya purchasi* Mask. Journal of Applied Entomology, 119, 621–623. https://doi.org/10.1111/j.1439-0418.1995.tb01346.x

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

Samia AY and Emam AS, 2020. Effect of Infested Rose Plants by *Icerya aegyptiaca* on the Physiological and Natural Characteristics of Rose Oil under Glasshouse Conditions. Egyptian Academic Journal of Biological Sciences, 13(1), 17–23. https://doi.org/10.21608/eajbsa.2020.68033

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 (1), 123–133.

Uesato T, Kondo T, Unruh C and Williams DJ, 2011. Establishment and host records of *Icerya aegyptiaca* (Douglas) (Hemiptera: Coccoidea: Monophlebidae) in the Sakishima Islands of the Ryukyu Archipelago, Japan, with notes on its worldwide distribution. Entomological Science, 14, 49–55. https://doi.org/10.1111/j.1479-8298.2010.00411.x

Unruh CM and Gullan PJ, 2008. Identification guide to species in the scale insect tribe Iceryini (Coccoidea: Monophlebidae). Zootaxa, 1803, 1–106.

Waterhouse DF, 1991. Possibilities for the biological control of the breadfruit mealybug, *Icerya aegyptiaca*, on Pacific Atolls. Micronesica Supplement, 3, 117–122.

Waterhouse DF, 1993. Biological control: Pacific prospects - supplement 2. Canberra, Australia: ACIAR, 138 pp.

Zhou Y, Wu J, Lin S, He J, Deng Y, He J and Cheng D, 2022. The synergistic effects of rosehip oil and matrine against *Icerya aegyptiaca* (Douglas) (Hemiptera: Coccoidea) and the underlying mechanisms. Pest Management Science, 78(8), 3424–3432. https://doi.org/10.1002/ps.6983

Abbreviations

EPPO	European and Mediterranean Plant Protection Organisation
FAO	Food and Agriculture Organisation
IPPC	International Plant Protection Convention
ISPM	International Standards for Phytosanitary Measures
MS	Member State
PLH	EFSA Panel on Plant Health
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 – *Icerya aegyptiaca* host plants/species affected

Host status	Host name	Plant family	Common name	Reference
Cultivated hosts	*Asystasia*	Acanthaceae		García Morales et al. (2016)
	Barleria	Acanthaceae		García Morales et al. (2016)
	Barleria cristata	Acanthaceae	blue-bell, crested Philippine violet	García Morales et al. (2016)
	Pseuderanthemum	Acanthaceae		García Morales et al. (2016)
	Ruellia simplex	Acanthaceae	desert petunia, Mexican blue bells, Mexican petunia	García Morales et al. (2016)
	Strobilanthes	Acanthaceae		García Morales et al. (2016)
	Mangifera indica	Anacardiaceae	mango	García Morales et al. (2016)
	Schinus terebinthifolia	Anacardiaceae	Brazilian pepper tree, broad-leaf pepper tree, Christmas berry, Florida holly, pepper berry, schinus	García Morales et al. (2016)
	Annona	Annonaceae		García Morales et al. (2016)
	Annona cherimola	Annonaceae	cherimoya, custard apple, graveola, sugar apple, sweet apple	García Morales et al. (2016)
	Annona squamosa	Annonaceae	Cuban sugar apple, custard apple, sugar apple, sweetsop	García Morales et al. (2016)
	Polyalthia longifolia	Annonaceae	Buddha tree, false ashoka, Indian fir tree, Indian mast tree, mast tree	García Morales et al. (2016)
	Peucedanum japonicum	Apiaceae	coastal hog fennel	García Morales et al. (2016)
	Carissa spinarum	Apocynaceae	bush plum, conkerberry	García Morales et al. (2016)
	Ochrosia	Apocynaceae		García Morales et al. (2016)
	Cyrtosperma merkusii	Araceae		García Morales et al. (2016)
	Monstera	Araceae		García Morales et al. (2016)
	Arecaceae	Arecaceae		García Morales et al. (2016)
	Cocos nucifera	Arecaceae	common coconut palm	García Morales et al. (2016)
	Hyophorbe verschaffeltii	Arecaceae	spindle palm	García Morales et al. (2016)
	Latania	Arecaceae		García Morales et al. (2016)
	Phoenix dactylifera	Arecaceae	common date palm, date palm	García Morales et al. (2016)
	Asparagus	Asparagaceae		García Morales et al. (2016)
	Bidens pilosa	Asteraceae	beggartick, blackjack, common blackjack, railway daisy, Spanish needle	García Morales et al. (2016)
	Gaillardia aristata	Asteraceae	blanket flower	García Morales et al. (2016)
	Helianthus	Asteraceae		García Morales et al. (2016)
	Melanthera biflora	Asteraceae	beach sunflower	García Morales et al. (2016)
	Pluchea indica	Asteraceae	Indian fleabane	García Morales et al. (2016)

Host status	Host name	Plant family	Common name	Reference
	Pluchea odorata	Asteraceae	bitter tobacco, hairy fleabane, saltmarsh fleabane, shrubby fleabane, spurbush	García Morales et al. (2016)
	Jacaranda	Bignoniaceae		García Morales et al. (2016)
	Ehretia	Boraginaceae		García Morales et al. (2016)
	Boswellia sacra	Burseraceae	bible frankincense, olibanum, Omani frankincense	García Morales et al. (2016)
	Buxus liukiuensis	Buxaceae		García Morales et al. (2016)
	Calophyllum inophyllum	Calophyllaceae	Alexandrian laurel, beach calophyllum, beauty leaf, Borneo mahogony, dilo oil tree, dingkaran, Indian laurel, kamani, mastwood beauty-leaf, poon	García Morales et al. (2016)
	Trema	Cannabaceae		García Morales et al. (2016)
	Trema orientalis	Cannabaceae	charcoal tree, Indian nettle tree, Rhodesian elm, pigeon wood	García Morales et al. (2016)
	Carica papaya	Caricaceae	papaw, papaya, pawpaw, tree melon	García Morales et al. (2016)
	Drymaria	Caryophyllaceae		García Morales et al. (2016)
	Casuarina equisetifolia	Casuarinaceae	Australian oak, Australian pine, beach sea-oak, beefwood, bull oak, common ironwood, common ru, horse-tail beefwood, horse-tail tree, ironwood, she-oak	García Morales et al. (2016)
	Garcinia	Clusiaceae		García Morales et al. (2016)
	Ipomoea indica	Convolvulaceae	dawnflower, ocean-blue morning glory, perennial morning glory	García Morales et al. (2016)
	Alangium salviifolium	Cornaceae	sage-leaved alangium	García Morales et al. (2016)
	Thuja	Cupressaceae		García Morales et al. (2016)
	Cyathea mertensiana	Cyatheaceae		García Morales et al. (2016)
	Cycas revoluta	Cycadaceae	Japanese fern palm, Japanese sago palm, king sago, sago cycad, sago cycas	García Morales et al. (2016)
	Diospyros vera	Ebenaceae	sea ebony	García Morales et al. (2016)
	Elaeocarpus sylvestris	Elaeocarpaceae		García Morales et al. (2016)
	Acalypha	Euphorbiaceae		García Morales et al. (2016)
	Alchornea liukiuensis	Euphorbiaceae		García Morales et al. (2016)
	Alchornea trewioides	Euphorbiaceae	Christmas bush	García Morales et al. (2016)
	Codiaeum	Euphorbiaceae		García Morales et al. (2016)
	Codiaeum variegatum	Euphorbiaceae	croton, garden croton, variegated croton	García Morales et al. (2016)
	Croton	Euphorbiaceae		García Morales et al. (2016)
	Euphorbia	Euphorbiaceae		García Morales et al. (2016)

Host status	Host name	Plant family	Common name	Reference
	Euphorbia tirucalli	Euphorbiaceae	bone tree, finger euphorbia, finger tree, Indian tree spurge, milk tree, milkbush, pencil tree, rubber euphorbia	García Morales et al. (2016)
	Jatropha	Euphorbiaceae		García Morales et al. (2016)
	Macaranga	Euphorbiaceae		García Morales et al. (2016)
	Macaranga tanarius	Euphorbiaceae	blush macaranga, hairy mahang, parasol leaf tree	García Morales et al. (2016)
	Mallotus japonicus	Euphorbiaceae	food wrapper plant	García Morales et al. (2016)
	Vernicia fordii	Euphorbiaceae	Chinese wood-oil tree, tung-oil tree	García Morales et al. (2016)
	Acacia	Fabaceae		García Morales et al. (2016)
	Acacia decurrens	Fabaceae	black wattle, early black wattle, green wattle	García Morales et al. (2016)
	Cajanus cajan	Fabaceae	Bengal pea, cajan pea, Congo pea, dal, pigeon pea, red gram	García Morales et al. (2016)
	Cassia	Fabaceae		García Morales et al. (2016)
	Delonix regia	Fabaceae	fire tree, flamboyant, flamboyant tree, flame of the forest, flame tree, royal poinciana	García Morales et al. (2016)
	Erythrina	Fabaceae		García Morales et al. (2016)
	Leucaena leucocephala	Fabaceae	horse tamarind, ipil ipil, jumpy-bean, subabul, white babool, white popinac, wild tamarind	García Morales et al. (2016)
	Parkinsonia aculeata	Fabaceae	Jerusalem thorn	García Morales et al. (2016)
	Pithecellobium	Fabaceae		García Morales et al. (2016)
	Prosopis juliflora	Fabaceae	algaroba bean, mesquite	García Morales et al. (2016)
	Samanea saman	Fabaceae	cow tamarind, monkey pod, rain tree, saman	García Morales et al. (2016)
	Senna didymobotrya	Fabaceae	African senna, candelabra tree, peanut-butter cassia, popcorn bush, popcorn cassia, popcorn senna	García Morales et al. (2016)
	Vigna marina	Fabaceae	beach pea, nanea, notched cowpea	García Morales et al. (2016)
	Flagellaria indica	Flagellariaceae	wild ratan	García Morales et al. (2016)
	Scaevola	Goodeniaceae		García Morales et al. (2016)
	Scaevola taccada	Goodeniaceae	beach naupaka, half-flower, naupaka, sea lettuce, sea lettuce tree	García Morales et al. (2016)
	Hypericum mysurense	Hypericaceae		García Morales et al. (2016)
	Leucas	Lamiaceae		García Morales et al. (2016)
	Ocimum tenuiflorum	Lamiaceae	holy basilt, Indian holy basil	García Morales et al. (2016)
	Tectona grandis	Lamiaceae	common teak, teak	García Morales et al. (2016)
	Persea americana	Lauraceae	avocado	CABI, online
	Litsea japonica	Lauraceae	litsea	García Morales et al. (2016)

Host status	Host name	Plant family	Common name	Reference
	Litsea rotundifolia	Lauraceae		García Morales et al. (2016)
	Machilus thunbergii	Lauraceae	makko	García Morales et al. (2016)
	Barringtonia	Lecythidaceae		García Morales et al. (2016)
	Ammannia	Lythraceae		García Morales et al. (2016)
	Cuphea hyssopifolia	Lythraceae	false heather	García Morales et al. (2016)
	Lawsonia inermis	Lythraceae	henna, mignonette tree	García Morales et al. (2016)
	Pemphis acidula	Lythraceae	mentigi	García Morales et al. (2016)
	Punica granatum	Lythraceae	pomegranate	García Morales et al. (2016)
	Sonneratia	Lythraceae		García Morales et al. (2016)
	Magnolia grandiflora	Magnoliaceae	bull bay, evergreen magnolia, large-flowered magnolia, southern magnolia	García Morales et al. (2016)
	Ceiba pentandra	Malvaceae	giant kapok, God's tree, kapok tree, silk cotton tree	García Morales et al. (2016)
	Cullenia	Malvaceae		García Morales et al. (2016)
	Hibiscus	Malvaceae		García Morales et al. (2016)
	Hibiscus rosa-sinensis	Malvaceae	China rose, Chinese hibiscus, Chinese rose, Hawaiian hibiscus, rose mallow, rose of China, shoe-black plant, shoe-flower	García Morales et al. (2016)
	Memecylon edule	Melastomataceae		García Morales et al. (2016)
	Melia azedarach	Meliaceae	bead tree, China berry, chinaberry tree, Indian lilac, Persian lilac, pride of India, seringa, umbrella tree, white cedar	García Morales et al. (2016)
	Tinospora	Menispermaceae		García Morales et al. (2016)
	Montinia	Montiniaceae		García Morales et al. (2016)
	Artocarpus altilis	Moraceae	breadfruit, breadfruit tree	García Morales et al. (2016)
	Artocarpus heterophyllus	Moraceae	jackfruit	García Morales et al. (2016)
	Ficus	Moraceae		García Morales et al. (2016)
	Ficus amplissima	Moraceae		García Morales et al. (2016)
	Ficus benghalensis	Moraceae	banyan, banyan fig, East India fig, horn fig, Indian banyan	García Morales et al. (2016)
	Ficus benjamina	Moraceae	Benjamin's fig, ficus tree, Java fig, small-leaved rubber plant, tropical laurel, weeping fig	García Morales et al. (2016)
	Ficus carica	Moraceae	common fig, fig	García Morales et al. (2016)
	Ficus elastica	Moraceae	Assam rubber tree, Indian rubber fig, Indian rubber plant, rubber fig, rubber plant	García Morales et al. (2016)
	Ficus erecta	Moraceae		García Morales et al. (2016)
	Ficus exasperata	Moraceae		García Morales et al. (2016)
	Ficus hirta	Moraceae		García Morales et al. (2016)
	Ficus lacor	Moraceae		García Morales et al. (2016)

Host status	Host name	Plant family	Common name	Reference
	Ficus microcarpa	Moraceae	Chinese banyan, curtain fig, glossy-leaf fig, Indian laurel, laurel fig, Malay banyan	García Morales et al. (2016)
	Ficus platyphylla	Moraceae		García Morales et al. (2016)
	Ficus rubiginosa	Moraceae	rusty fig	García Morales et al. (2016)
	Ficus sycomorus	Moraceae	mulberry fig, sycomore fig	García Morales et al. (2016)
	Ficus tinctoria	Moraceae	dye fig, humped fig	García Morales et al. (2016)
	Ficus virens	Moraceae		García Morales et al. (2016)
	Morus alba	Moraceae	silkworm mulberry, white mulberry	EPPO (online), García Morales et al. (2016)
	Morus australis	Moraceae		García Morales et al. (2016)
	Musa	Musaceae		García Morales et al. (2016)
	Musa x paradisiaca	Musaceae	banana, common banana, plantain	García Morales et al. (2016)
	Eugenia	Myrtaceae		García Morales et al. (2016)
	Myrtus communis	Myrtaceae	common myrtle, myrtle, true myrtle	García Morales et al. (2016)
	Psidium	Myrtaceae		García Morales et al. (2016)
	Psidium cattleyanum	Myrtaceae	cherry guava, strawberry guava	García Morales et al. (2016)
	Psidium guajava	Myrtaceae	common guava, guava, yellow guava	EPPO (online), García Morales et al. (2016)
	Syzygium cumini	Myrtaceae	black plum, jambolan, jamun, Java plum, Malabar plum	García Morales et al. (2016)
	Syzygium samarangense	Myrtaceae	jambu air, Java apple, wax apple	García Morales et al. (2016)
	Ludwigia octovalvis	Onagraceae	Mexican primrose-willow, swamp primrose, water primrose	García Morales et al. (2016)
	Pandanus utilis	Pandanaceae	common screw palm, common screw pine, Madagascar screw palm, screw pine	García Morales et al. (2016)
	Antidesma montanum	Phyllanthaceae		García Morales et al. (2016)
	Bischofia javanica	Phyllanthaceae	bishopwood, Java bishopwood, toog	García Morales et al. (2016)
	Bridelia	Phyllanthaceae		García Morales et al. (2016)
	Bridelia tomentosa	Phyllanthaceae		García Morales et al. (2016)
	Glochidion	Phyllanthaceae		García Morales et al. (2016)
	Pittosporum	Pittosporaceae		García Morales et al. (2016)
	Plumbago auriculata	Plumbaginaceae	blister bush, Cape plumbago, lead vine, leadwort	García Morales et al. (2016)
	Zea mays	Poaceae	maize	García Morales et al. (2016)
	Drypetes integerrima	Putranjivaceae		García Morales et al. (2016)
	Clematis chinensis	Ranunculaceae		García Morales et al. (2016)
	Clematis terniflora	Ranunculaceae	sweet autumn clematis	García Morales et al. (2016)
	Ziziphus	Rhamnaceae		García Morales et al. (2016)

Host status	Host name	Plant family	Common name	Reference
	Malus prunifolia	Rosaceae	plum-leaved crab apple, snow cap	García Morales et al. (2016)
	Osteomeles schwerinae	Rosaceae		García Morales et al. (2016)
	Prunus	Rosaceae		García Morales et al. (2016)
	Pyrus communis	Rosaceae	common pear, pear	García Morales et al. (2016)
	Rhaphiolepis indica	Rosaceae	Indian hawthorn	García Morales et al. (2016)
	Rosa	Rosaceae		García Morales et al. (2016)
	Psychotria asiatica	Rubiaceae		García Morales et al. (2016)
	Psychotria boninensis	Rubiaceae		García Morales et al. (2016)
	Rubia cordifolia	Rubiaceae	Indian madder	García Morales et al. (2016)
	Citrus	Rutaceae		EPPO (online), García Morales et al. (2016)
	Citrus aurantiifolia	Rutaceae	key lime, lime, Mexican lime, West Indian lime	García Morales et al. (2016)
	Citrus reticulata	Rutaceae	clementine, clementine tree, mandarin, tangerine	EPPO (online)
	Citrus sinensis	Rutaceae	sweet orange	EPPO (online)
	Glycosmis pentaphylla	Rutaceae	gin berry, orangeberry	García Morales et al. (2016)
	Melicope grisea	Rutaceae		García Morales et al. (2016)
	Salix babylonica	Salicaceae	Chinese willow, mourning willow, Peking willow, weeping willow	García Morales et al. (2016)
	Dodonaea viscosa	Sapindaceae	broad-leaf hopbush, hop-seed bush, sand olive, switchsorrel, varnish leaf	García Morales et al. (2016)
	Manilkara zapota	Sapotaceae	bully tree, chapoti, chicle, chiku, marmalade plum, noseberry, sapodilla, sapodilla plum, sapota	García Morales et al. (2016)
	Planchonella obovata	Sapotaceae		García Morales et al. (2016)
	Capsicum	Solanaceae		García Morales et al. (2016)
	Solanum lycopersicum	Solanaceae	tomato	García Morales et al. (2016)
	Tamarix	Tamaricaceae		García Morales et al. (2016)
	Camellia sinensis	Theaceae	tea, tea plant	EPPO (online)
	Boehmeria nivea	Urticaceae	China grass, false nettle, ramie	García Morales et al. (2016)
	Lantana	Verbenaceae		García Morales et al. (2016)
	Vitis vinifera	Vitaceae	common grapevine, grapevine	García Morales et al. (2016)
	Coffea arabica	Rubiaceae	Arabian coffee, coffee tree	EPPO (online)
Wild weed hosts	*Ochrosia nakaiana*	Apocynaceae		García Morales et al. (2016)
	Synedrella nodiflora	Asteraceae	nodeweed, porterbush, sessile-flowered synedrella	García Morales et al. (2016)
	Solanum nigrum	Solanaceae	black nightshade, common nightshade, hound berry, sunberry, wonderberry	García Morales et al. (2016)

Source: EPPO Global Database (EPPO online), and García Morales et al (ScaleNet, online).

Appendix B – Distribution of *Icerya aegyptiaca*

Distribution records based on EPPO Global Database (EPPO, online), CABI (online), García Morales et al. (ScaleNet, online) and literature.

Region	Country	Sub-national (e.g. State)	Status
Africa	Benin		Present, no details
	Cote d'Ivoire		Present, no details
	Egypt		Present, no details
	Kenya		Present, no details
	Nigeria		Present, no details
	Somalia		Present, no details
	Sudan		Present, no details
	Tanzania		Present, no details
	Togo		Present, no details
Asia	Bangladesh		Present, no details
	China		Present, restricted distribution
	China	Guangdong	Present, no details
	China	Xianggang (Hong Kong)	Present, no details
	China	Guangzhou	Present, no details
	India		Present, no details
	India	Andaman and Nicobar Islands	Present, no details
	India	Assam	Present, no details
	India	Bihar	Present, no details
	India	Gujarat	Present, no details
	India	Karnataka	Present, no details
	India	Kerala	Present, no details
	India	Lakshadweep	Present, no details
	India	Maharashtra	Present, no details
	India	Meghalaya	Present, no details
	India	Odisha	Present, no details
	India	Tamil Nadu	Present, no details
	India	Telangana	Present, no details
	India	Tripura	Present, no details
	India	West Bengal	Present, no details
	Indonesia	Kalimantan (=Borneo)	Present, no details
	Indonesia	Sulawesi (=Celebes)	Present, no details
	Iran		Present, no details
	Israel		Present, widespread
	Japan		Present, no details
	Laos		Present, no details
	Malaysia		Present, no details
	Malaysia	Sabah	Present, no details
	Malaysia	Sarawak	Present, no details
	Malaysia	West	Present, no details
	Maldives		Present, no details
	Myanmar		Present, no details
	Oman		Present, no details
	Pakistan		Present, no details
	Philippines		Present, no details
	Ryukyu Islands (=Nansei Shoto)		Present, no details

Region	Country	Sub-national (e.g. State)	Status
	Saudi Arabia		Present, no details
	Singapore		Present, no details
	Sri Lanka		Present, no details
	Taiwan		Present, no details
	Thailand		Present, no details
	Vietnam		Present, no details
	Yemen		Present, no details
Oceania	Australia		Present, restricted distribution
	Australia	New South Wales	Present, no details
	Australia	Northern Territory	Present, no details
	Australia	Queensland	Present, no details
	Bonin Islands (=Ogasawara-Gunto)		Present, no details
	Fiji		Present, no details
	French Polynesia		Present, no details
	Guam		Present, no details
	Kiribati		Present, no details
	Marshall Islands		Present, no details
	Micronesia		Present, no details
	Nauru		Present, no details
	Northern Mariana Islands		Present, no details
	Palau		Present, no details
	Samoa		Present, no details
	Tuvalu		Present, no details
	US minor outlying islands		Present, no details
	Wake Island		Present, no details
South America	Colombia		Record seems to be invalid

Appendix C – Import data

Table C.1: Fresh or dried citrus (CN code: 0805) imported in 100 kg into the EU (27) from regions where *Icerya aegyptiaca* is known to occur (Source: Eurostat accessed on 5/7/2022)

Country	2016	2017	2018	2019	2020	2021
Australia	3,279.84	1,284.38	644.97	10,645.40	2,343.47	4,097.42
Bangladesh	227.61	229.58	159.67	322.42	1,183.66	289.22
Côte d'Ivoire	224.00		246.40			
China	827,840.57	1,084,857.27	1,024,163.15	1,108,595.22	1,098,689.98	648,410.51
Egypt	1,931,586.64	2,246,998.88	2,643,272.02	2,206,932.71	2,850,745.77	3,398,718.39
Indonesia	566.73	555.70	779.35	836.73	864.54	872.68
Israel	799,118.49	969,403.62	824,601.66	812,738.57	878,713.18	781,576.35
India	246.80	1.00	449.63	88.51	254.95	22.37
Iran, Islamic Republic of	1,533.22	1,218.52	1,208.01	2,174.22	1,882.74	1,910.39
Japan	352.58	417.44	270.73	319.24	162.50	184.26
Kenya			8.80		34.56	0.02
Lao People's Democratic Republic (Laos)	51.94	2.10			20.23	0.95
Sri Lanka	0.82	80.98	135.62	0.20	60.10	0.03
Malaysia	4.18	39.02	83.45	7.71		
Nigeria			0.03	0.10	200.00	
Oman						16.23
French Polynesia	0.28	0.28	0.86			
Philippines			0.20	7.71	0.10	
Pakistan			2.45	0.59		272.00
Saudi Arabia				0.09	0.07	0.01
Sudan			2.10		20.58	
Singapore						0.03
Somalia	490.30	193.21	367.52	514.30	342.10	556.99
Togo		0.16	6.24	0.42		
Thailand	426.42	1,283.13	659.74	624.93	194.87	245.31
Taiwan	157.49				0.01	
Tanzania, United Republic of	179.90	190.01	144.12	35.95	75.50	132.27
Viet Nam	28,649.46	46,738.17	70,934.07	73,964.35	63,730.02	81,731.29
Yemen						2.40

Table C.2: Fresh or dried guavas, mangoes and mangosteens (CN code: 080450) imported in 100 kg into the EU (27) from regions where *Icerya aegyptiaca* is known to occur (Source: Eurostat accessed on 5/7/2022)

Country	2016	2017	2018	2019	2020	2021
Australia	25.72	94.18	62.92			0.01
Bangladesh	438.53	256.66	331.27	310.73	323.91	1,538.1
Benin		26.4			226.79	2,590.32
Côte d'Ivoire	229,117.62	268,109.01	278,429.74	281,610.27	230,154.91	272,569.1
China	38.95	51.87	180.81	78.23	104.34	248.77
Egypt	4,135.64	9,186.69	4,855.57	6,407.46	12,233.16	6,222.9
Indonesia	1,981.2	2,004.36	2,926.64	2,386.27	1,406.94	1,629.72

Country	2016	2017	2018	2019	2020	2021
Israel	143,726.08	140,551.3	108,353.48	121,875.16	98,143.59	124,186.38
India	5,989.34	8,148.87	9,470.36	9,315.51	7,347.61	16,575.2
Iran, Islamic Republic of	15.65	12.12	3.00	9.1	1.56	19.45
Japan	0.66				0.01	7.66
Kenya	232.06	4.08	65.09	10.3	66.53	1,497.12
Lao People's Democratic Republic (Laos)	753.34	620.36	603.14	806.5	525.32	285.98
Sri Lanka	1,254.27	1,003.35	765.31	813.83	423.16	540.14
Myanmar (Burma)		0.28	1.47	1.00		
Malaysia	289.86	197.22	170.64	72.72	44.56	19.01
Nigeria	0.78	0.1	1.13	1.95	0.03	28.59
Oman				223.93		
French Polynesia	0.11	1.3	0.47			0.17
Philippines	1,028.05	519.88	795.56	368.97	128.1	153.67
Pakistan	17,149.78	15,912.58	21,867.43	29,207.33	16,196.5	19,732.88
Saudi Arabia	0.1	0.69	95.05		0.18	332.07
Sudan	34.71	43.3	215.93	29.99	10.00	11.00
Togo	39.19	58.16	57.86	221.65	40.00	5.62
Thailand	6,460.81	7,401.8	6,911.89	6,743.92	5,260.84	4,918.99
Taiwan			3.48	17.34	0.92	5.28
Tanzania, United Republic of			0.5	1.14		0.09
United States Minor Outlying Islands						103.68
Viet Nam	794.89	950.37	1,346.64	1,546.69	965.31	2,761.09

Table C.3: Tomatoes, fresh or chilled (CN code: 05440) imported in 100 kg into the EU (27) from regions where *Icerya aegyptiaca* is known to occur (Source: Eurostat accessed on 5/7/2022)

Country	2016	2017	2018	2019	2020	2021
Australia				2.52		
Côte d'Ivoire			0.1			
Egypt	9,135.43	14,023.94	15,102.55	18,876.68	9,491.42	4,133.46
Israel	16,739.21	10,861.22	6,392.59	782.65	138.00	913.18
India				0.01		0.79
Iran, Islamic Republic of		363.79			11.13	
Japan	13.75	8.98	13.31	45.67	34.37	2.81
Malaysia						0.04
Oman					1.27	
Philippines						5.23
Thailand	0.08	0.08	0.08	0.02	0.02	0.04
Viet Nam	0.03	0.06				

Table C.4: Bananas, incl. plantains, fresh or dried (CN code: 0803) imported in 100 kg into the EU (27) from regions where *Icerya aegyptiaca* is known to occur (Source: Eurostat accessed on 5/7/2022)

Country	2016	2017	2018	2019	2020	2021
Australia					0.01	0.01
Bangladesh	174.66	79.85	72.75	38.05	35.64	108.33
Benin						0.17
Côte d'Ivoire	2,650,123.42	2,475,913.6	2,698,541.71	3,149,251.32	3,129,957.64	3,155,082.31
China	252.64	188.73	390.56	545.74	854.93	1,158.14
Egypt	42.98	0.18	146.87			
Indonesia		0.01	37.27	14.72	64.17	3.43
Israel	2.1				0.75	1.7
India	515.19	445.99	571.13	607.74	1,418.91	1,491.81
Iran, Islamic Republic of			0.09	2.86	12.33	21.43
Japan						3.82
Kenya	1.9	0.72	6.15	11.23	14.95	36.81
Lao People's Democratic Republic (Laos)	81.44	65.75	69.83	45.51	20.4	8.63
Sri Lanka	1,187.82	2,177.81	2,087.47	2,760.36	2,512.84	3,655.84
Myanmar (Burma)						0.15
Malaysia			8.02			0.64
Nigeria	0.72	2.04	2.5	0.84	6.35	9.46
French Polynesia	0.04	0.04	2.41	0.02	0.38	0.01
Philippines	2,480.9	11,415.47	1,674.92	2,160.35	1,240.8	1,665.89
Pakistan			2.6	49.7		
Saudi Arabia			5.00			
Sudan			0.2			
Singapore		0.06	0.12		0.00	0.94
Togo	4.61	11.78	10.61	23.41	18.22	5.78
Thailand	550.44	674.34	603.32	526.15	334.58	742.96
Taiwan	0.15					1.06
Tanzania, United Republic of	28.02	11.93	33.68	34.24	34.74	63.45
Viet Nam	276.26	178.84	190.96	210.11	142.71	261.01

Table C.5: Grapes, fresh or dried (CN code: 0806) imported in 100 kg into the EU (27) from regions where *Icerya aegyptiaca* is known to occur (Source: Eurostat accessed on 5/7/2022)

Country	2016	2017	2018	2019	2020	2021
Australia	30,009.97	24,989.4	28,005.6	24,170.86	24,170.86	24,170.86
Bangladesh	1.05		0.5			
Côte d'Ivoire	200.00					
China	125,769.00	47,957.9	87,690.22	191,986.55	191,986.55	191,986.55
Egypt	330,566.05	404,802.55	429,995.18	442,801.07	442,801.07	442,801.07
Israel	13,171.8	7,365.66	6,433.57	320.43	320.43	320.43
India	701,938.16	849,117.89	741,303.06	970,130.19	970,130.19	970,130.19
Iran, Islamic Republic of	178,916.63	146,040.55	101,488.05	165,329.68	165,329.68	165,329.68
Japan	6.03	4.37	1.52	1.19	1.19	1.19

Country	2016	2017	2018	2019	2020	2021
Kenya			186.96			
Philippines	0.48					
Pakistan	6,148.97	10,762.89	14,655.68	13,385.6	13,385.6	13,385.6
Saudi Arabia	0.00	1.51	45.00	0.04	0.04	0.04
Singapore	4.34	603.53	3.49	1.75	1.75	1.75
Thailand	1.63	92.32	4.46	0.87	0.87	0.87
Yemen		0.01				

Table C.6: Maize or corn (CN code: 1005) imported in 100 kg into the EU (27) from regions where *Icerya aegyptiaca* is known to occur (Source: Eurostat accessed on 5/7/2022)

Country	2016	2017	2018	2019	2020	2021
Australia	19,916.87	19,821.1	20,988.74	30.32	1.97	20.88
Bangladesh						4.00
Benin						0.06
Côte d'Ivoire		171.56	50.21	34.24	55.33	461.92
China	330.8	49,315.06	13,505.7	1,857.99	536.71	375.87
Egypt	49.8	242.83	15.00	248.7	11.3	4.25
Indonesia		0.2		4.00	3.41	0.15
Israel	69.12	0.73	80.19	0.01	8.84	1.32
India	4,912.69	110.41	9,903.18	663.15	2,040.51	2,412.22
Iran, Islamic Republic of		13.71	198.98			12.68
Japan	1.12	2.3	319.93	1,606.96	51.58	334.81
Kenya	469.95	528.97	384.28	228.81	250.00	690.09
Lao People's Democratic Republic (Laos)	0.98					
Sri Lanka					7.17	737.98
Malaysia	0.1				8.05	3.00
Nigeria		12.67	3.01	0.72	116.26	5.82
Philippines	0.74	0.18	1.93	0.68	0.92	2.94
Pakistan	1.81					3.86
Saudi Arabia			2.00	7.7		2.54
Somalia				48.6	28.8	28,571.83
Togo			3.00	12.8	1.42	12.61
Thailand	1,706.41	1,841.34	1,801.98	1,615.47	6,117.68	5,250.64
Taiwan					1.33	3.04
Tanzania, United Republic of			0.02	0.21		
Viet Nam	27.51	6.91	10.2	29.84	184.01	171.8

Table C.7: Roses whether or not grafted (CN code: 060240) imported in 100 kg into the EU (27) from regions where *Icerya aegyptiaca* is known to occur (Source: Eurostat accessed on 5/7/2022)

Country	2016	2017	2018	2019	2020	2021
China	2,318.97	1,019.42	2,510.23	623.75	3.01	623.1
Indonesia					0.04	0.04
Israel		4.06	0.04	150.01		0.09
India	3.67	3.52	17.18	17.67	17.8	24.68
Japan	0.03	19.97	0.01	0.15	0.85	0.02
Kenya	35.87		9.57	6.92	15.7	

Country	2016	2017	2018	2019	2020	2021
Sri Lanka	46.16					
Thailand		0.08	1.8	0.38		4.68
Taiwan				0.02		