SCIENTIFIC OPINION

efsa JOURNAL

ADOPTED: 19 September 2023

doi: 10.2903/j.efsa.2023.8320

Pest categorisation of *Pochazia shantungensis*

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, Virag Kertesz, Andrea Maiorano and Alan MacLeod

Abstract

The EFSA Panel on Plant Health performed a pest categorisation of *Pochazia shantungensis* (Hemiptera: Auchenorrhyncha: Ricaniidae) for the EU following commodity risk assessments of *Malus domestica*, *Prunus persica*, *P. dulcis* and *Robinia pseudoacacia* plants for planting from Türkiye in which *P. shantungensis* was identified as a pest that could potentially enter the EU. The native range of *P. shantungensis* is China (Shaanxi, Shandong and Zhejiang provinces), but around 2010, the species entered the Republic of Korea and rapidly spread. Small and localised populations were also recently found in Türkiye (Marmara) and southern Russia (Krasnodyarskiy kray). Within the EU, a few individuals have been recorded in Italy (Pistoia province, Tuscany), in one locality in southern France (Alpes-Maritimes), in the Netherlands (Western Netherlands) and in one garden in Germany (Baden-Württemberg) where it was eradicated. *P. shantungensis* is not listed in Annex II of Commission Implementing Regulation (EU) 2019/2072. It is polyphagous, feeding on plants belonging to more than 200 species including many crop and ornamental plants. Economically important hosts in the EU include apple (*M. domestica*), citrus (*Citrus* spp.), walnut (*Castanea* sp.) and ornamentals such as hibiscus (*Hibiscus* spp.) and camellia (*Camellia japonica*), as well as forest trees, mostly deciduous. In the Republic of Korea, the species has one generation per year. It overwinters as eggs and goes through five nymphal instars. Its impact is due to oviposition obstructing the vascular system of its hosts, depletion of the host resources and egestion of honeydew promoting the development of sooty moulds. Plants for planting constitute the main pathway for entry into the EU and for spread. Climatic conditions in southern EU countries and host plant availability in those areas would allow establishment and spread. The introduction of *P. shantungensis* is expected to have an economic impact in the EU through the reduction in yield, quality and commercial value of fruits and ornamental plants. Phytosanitary measures are available to reduce the likelihood of entry and further spread. *P. shantungensis* meets the criteria that are within the remit of EFSA to assess for it to be regarded as a potential Union quarantine pest.

© 2023 European Food Safety Authority. *EFSA Journal* published by Wiley-VCH GmbH on behalf of European Food Safety Authority.

Keywords: pest risk, plant health, plant pest, quarantine

Requestor: European Commission

Question number: EFSA-Q-2023-00322

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.

Declarations of interest: If you wish to access the declaration of interests of any expert contributing to an EFSA scientific assessment, please contact interestmanagement@efsa.europa.eu.

Acknowledgements: EFSA wishes to acknowledge Oresteia Sfyra for her substantial contribution throughout the preparation of the scientific opinion and Alex Gobbi for coordinating and executing the climate suitability exercise.

Suggested citation: EFSA PLH Panel (EFSA Panel on Plant Health), Bragard, C., Baptista, P., Chatzivassiliou, E., Di Serio, F., Gonthier, P., Jaques Miret, J. A., Justesen, A. F., Magnusson, C. S., Milonas, P., Navas-Cortes, J. A., Parnell, S., Potting, R., Reignault, P. L., Stefani, E., Thulke, H.-H., Van der Werf, W., Vicent Civera, A., Yuen, J., … MacLeod, A. (2023). Pest categorisation of *Pochazia shantungensis*. *EFSA Journal*, *21*(10), 1–32. https://doi.org/10.2903/j.efsa.2023.8320

ISSN: 1831-4732

© 2023 European Food Safety Authority. *EFSA Journal* published by Wiley-VCH GmbH on behalf of European Food Safety Authority.

This is an open access article under the terms of the Creative Commons Attribution-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited and no modifications or adaptations are made.

EFSA may include images or other content for which it does not hold copyright. In such cases, EFSA indicates the copyright holder and users should seek permission to reproduce the content from the original source.

The EFSA Journal is a publication of the European Food Safety Authority, a European agency funded by the European Union.

Table of contents

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

Pochazia shantungensis 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*, *P. dulcis* and *Robinia pseudoacacia* plants from Türkiye performed by EFSA (EFSA PLH Panel, 2022, 2021, 2023), in which *P. shantungensis* was identified as a relevant non-regulated EU pest which could potentially enter the EU on *M. domestica, P. persica*, *P. dulcis* and *R. pseudoacacia*.

2. Data and methodologies

2.1. Data

2.1.1. Information on pest status from NPPOs

In the context of the current mandate, EFSA is preparing pest categorisations for new/emerging pests that are not yet regulated in the EU. When official pest status is not available in the European and Mediterranean Plant Protection Organization (EPPO) Global Database (EPPO, online), EFSA consults the NPPOs of the relevant MSs. To obtain information on the official pest status for *P. shantungensis*, EFSA has consulted the NPPOs of Italy.

2.1.2. Literature search

A literature search on *P. shantungensis* 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.

2.1.3. 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 *P. shantungensis* 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 *P. shantungensis*, 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. *Pochazia shantungensis* (Chou & Lu) is the accepted name.

Pochazia shantungensis (Chou and Lu, 1977) is an insect of the family Ricaniidae within the order Hemiptera, suborder Auchenorrhyncha, infra-order Fulgoromorpha. Its taxonomic placement has been recently reviewed by Stroiński and Bourgoin (2022), based on morphological analyses, and on a study of the complete mitochondrial genome by Zhang et al. (2022). Their conclusions are still provisional,

pending a more complete taxonomic revision of the full group. The present updated taxonomic status is accessible online (Bourgoin, 2019). The species is also referred to as *Ricania shantungensis* Chou and Lu, 1977 in recent publications (Baek et al., 2019a,b, 2020, 2021, 2022; Choi et al., 2011; Hizal et al., 2019; Kang et al., 2020; Kim et al., 2016; Kwon et al., 2017; Lee et al., 2018).

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

3.1.2. Biology of the pest

The pest has one generation per year in the Republic of Korea (Baek et al., 2019b); two generations per year have been reported in China (Baek, 2019). The eggs are the overwintering stage, they hatch in the spring from late May to early June in the Republic of Korea (Baek, 2019). From laboratory cultures at different temperatures, Baek et al. (2019b) determined their lower developmental threshold (12.1°C), thermal constant (202 DD), optimal developmental temperature (31°C) and upper developmental threshold (36.9°C). There are five immature stages, the adults appear in mid-July in the Republic of Korea, and start ovipositing in early August (Baek, 2019), laying their eggs in zigzag rows into new twigs and covering them with a waxy wool (Hizal et al., 2019). On apple and plum, the eggs were laid close to each other in egg masses, ~ 12 mm long and including 15–19 eggs each (Choi et al., 2011). On Korean chestnut (*Castanea crenata*), Baek (2019) counted densities (mean ± SE) of 10.4 ± 3.59, 3.3 ± 1.05, 2.0 ± 0.93 and 2.2 ± 0.63 individuals per sampling unit (two pieces of 50 cm long branches) for spring egg masses, nymphs, adults and winter egg masses, respectively. The adults and nymphs are mobile (Baek, 2019); the nymphs prefer herbaceous hosts rather than trees (Choi et al., 2016). Important features of the life-history strategy of *P. shantungensis* are summarised in Table 2.

Table 2: Important features of the life-history strategy of *Pochazia shantungensis*

Life stage	Phenology and relation to host	Other relevant information
Eggs	From early August (year 1) to early June (year 2) in the Republic of Korea	Oviposition on new twigs of the year on ligneous hosts
Nymphs	From late May to mid-July in the Republic of Korea. Prefer herbaceous hosts	Nymphs are mobile
Adult	From mid-July in the Republic of Korea	The adults are winged and mobile, although no measurement has been made to date

3.1.3. Host range/species affected

According to Stroiński (unpublished), in Bourgoin et al. (2020), the species is extremely polyphagous, feeding on more than 200 host plants (81 families, 157 genera, 208 species). Appendix A.1, based on EPPO (online), citing Kim et al. (2015); Stroiński et al. (2022); Hizal et al. (2019), lists 149 species belonging to 67 families. Kim et al. (2015), Jo et al. (2016), Kwon et al. (2017) and Hizal et al. (2023) list 73 additional species (Appendix A.2). Economically important crops in the EU include apple (*Malus domestica*), citrus (*Citrus* spp.), walnut (*Castanea* sp.) and ornamentals such as hibiscus (*Hibiscus* spp.) and camellia (*Camellia japonica*), as well as many deciduous forest trees.

3.1.4. Intraspecific diversity

No intraspecific diversity has been reported within the species.

3.1.5. Detection and identification of the pest

Are detection and identification methods available for the pest?

Yes, the pest can be detected visually and by trapping, and keys and descriptions have been published.

[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).

Detection

Egg masses are typical of the species (Figure 1). Economical and efficient sampling units for egg masses (50 cm branch tips, irrespective of vertical location on the trees or on orientation) have been described for Korean chestnut, *C. crenata* (Baek et al., 2020). For persimmons (*Diospyros* sp.), the terminal 60-cm length of the branches in the terminal positions on each trunk was determined by Baek et al. (2022a) as the optimal sampling unit. The eggs and adults are spatially clumped, and the nymphs present within a 60-m radius tend to cluster. These factors should be considered when organising a survey.

Yellow sticky traps are also efficient in catching adults (Kim et al., 2016).

Figure 1: Left: egg masses of *Pochazia shantungensis* on *Ligustrum lucidum*, covered with waxy filaments, with adults below (Courtesy: Erdem Hızal, Istanbul University-Cerrahpaşa (TR)). Right: a longitudinal, sagittal section in a twig showing that the eggs (red oval) are deeply inserted in the plant tissues (from Nam et al., 2020) © Magnolia Press

Identification

The adults are approximately 8 mm long, with a 30-mm wingspan (Chou and Lu, 1977; Hizal et al., 2019). They are recognisable by their triangular, flattened, dark brown or black silhouette at rest (Bourgoin et al., 2020) (Figure 2). Hizal et al. (2019) provide a short description of the adults: the vertex, frons, clypeus, rostrum and eyes are brown to dark brown. The ocelli are brown. The pronotum and mesonotum are black. The thorax is black ventrally. The forewing is dark brown to black with an elliptical-shaped white spot on the costal margin at about two-thirds from the base. The hind wing is dark brown. The legs are brown. The abdomen is dark brown except the posterior margin of each segment, which is yellow. The genital segment is dark brown to black. The nymphs are covered with waxy filaments (Figure 3). Rahman et al. (2012) provide a key to the species of *Pochazia* in the Republic of Korea.

Kwon et al. (2017) used two sets of nuclear and mitochondrial markers to analyse the phylogeny of *P. shantungensis*; Kang et al. (2020) have sequenced and annotated its complete mitochondrial genome; Zhang et al. (2022) published a comparative analysis of the complete mitochondrial genomes of five species of Ricaniidae belonging to the genera *Pochazia* and *Ricania*. There are 145 accessions in GeneBank regarding the mitochondrial genome of *P. shantungensis*.

Figure 2: Adult of *Pochazia shantungensis*. Courtesy: Erdem Hızal, Istanbul University-Cerrahpaşa (TR)

Figure 3: *Pochazia shantungensis* nymph. Courtesy: E.I. Shoshina, Russian Academy of Sciences

3.2. Pest distribution

3.2.1. Pest distribution outside the EU

The pest originates from China (Shaanxi, Shandong and Zhejiang) and was found for the first time in 2010 in the Republic of Korea (Choi et al., 2011). It has since gradually invaded the country and, in 2019, was present in more than half its territory (Baek 2019a). A small population was found in 2018 in Türkiye (Marmara region) (Hizal et al., 2019), and another small population was found in the Krasnodar Territory, Russia, in 2022 (Zhuravleva et al., 2023) (See Appendix B for more details; Figures 4 and 5).

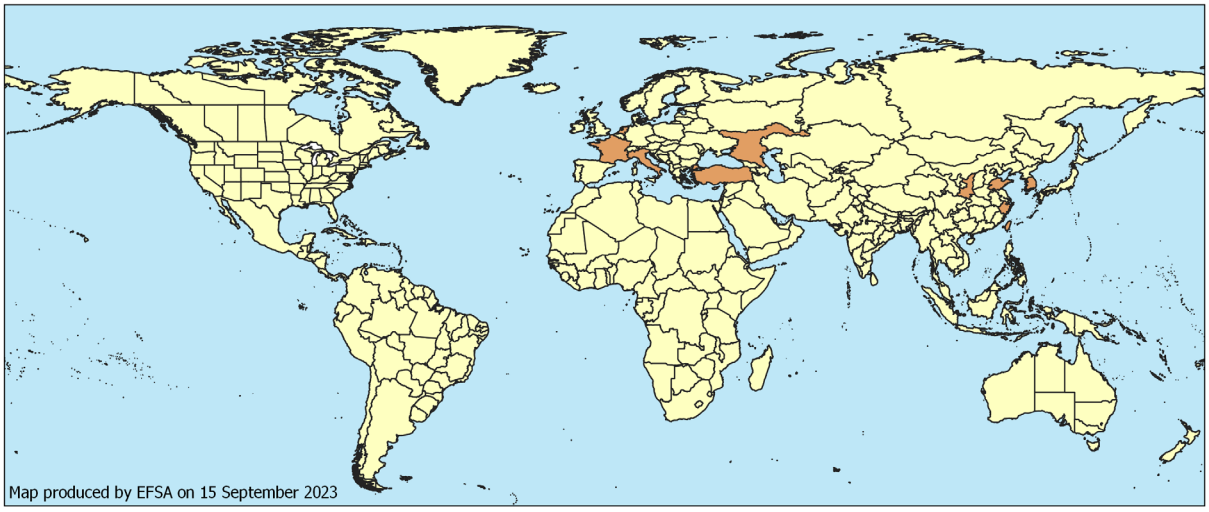

Figure 4: Global distribution of *Pochazia shantungensis* (data source: EPPO Global Database accessed on 15 September 2023 and literature)

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.

Yes, the pest is present in limited areas in France, Italy and the Netherlands, and has been found once in Germany.

In France, *P. shantungensis* has been found repeatedly (2018, 2019, 2022) in a garden in Cagnes-sur-Mer, Alpes-Maritimes, Provence-Alpes-Côte d'Azur region (Bourgoin et al., 2020; Stroiński and Bourgoin, 2022). It is declared as transient, actionable, under eradication by the French NPPO (2022–12) (https://gd.eppo.int/taxon/POCZSH/distribution/FR).

In Germany, a few adults were found in a garden in Baden-Württemberg in 2021 (Schrader 2021). It was declared as transient by the German NPPO (https://gd.eppo.int/taxon/POCZSH/distribution/DE) and eradicated in 2023.

In Italy, it was found in 2019 in several public and private gardens in Agliana, Pistoia Province, Tuscany (Stroiński et al., 2022).

In the Netherlands, a few nymphs were found in a private garden on the island of IJsselmonde, Western Netherlands. It is declared as transient, non-actionable; few specimens at one location, monitoring ongoing by the Dutch NPPO (https://gd.eppo.int/taxon/POCZSH/distribution/NL).

This information is summarised in Table 3.

Table 3: Distribution of *Pochazia shantungensis* in the EU

Region	Country	Sub-national (e.g. State)	Status	References
EU (27)	France	Alpes-Maritimes department in the Provence-Alpes-Côte d'Azur region	Transient, actionable, under eradication	EPPO, (online)
	Germany	Baden-Württemberg	Eradicated	EPPO, (online)
	Italy	Tuscany Region, Pistoia Province	Present, few occurrences	EPPO, (online), Stroiński et al. (2022)
	The Netherlands	Western Netherlands	Transient, non-actionable. Few specimens at one location, monitoring ongoing	EPPO (online)

3.3. Regulatory status

3.3.1. Commission implementing regulation 2019/2072

Pochanzia shantungensis 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 4 lists regulated articles prohibited from entering the EU and relevant to the entry of *P. shantungensis*.

Table 4: List of plants, plant products and other objects that are *Pochanzia shatungensis* 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**
2.	Plants of *Castanea* Mill. and *Quercus* L., with leaves, other than fruit and seeds	ex 0602 10 90 ex 0602 20 20 ex 0602 20 80 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 99 ex 0604 20 90 ex 1404 90 00	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, Turkey, Ukraine and the United Kingdom
3.	Plants of *Populus* L., with leaves, other than fruit and seeds	ex 0602 10 90 ex 0602 20 20 ex 0602 20 80 ex 0602 90 41 ex 0602 90 45 ex 0602 90 46 ex 0602 90 48	Canada, Mexico, United States

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 50 ex 0602 90 70 ex 0602 90 99 ex 0604 20 90 ex 1404 90 00	
8.	Plants for planting of *Chaenomeles* Ldl., [...]., *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 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 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, Turkey, 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, Turkey, Ukraine, the United Kingdom (1) and United States other than Hawaii
11.	Plants of *Citrus* L., [...] 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 1404 90 00	All third countries
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	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

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 91 ex 0602 90 99	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

High-risk plants ((EU)2018/2019) are prohibited from entering the EU territory pending risk assessment. Among them, *Acer* L., *Albizia* Durazz., *Alnus* Mill., *Castanea* Mill., *Cornus* L., *Corylus* L., *Diospyros* L., *Ficus carica* L., *Juglans* L., *Ligustrum* L., *Malus* Mill., *Populus* L., *Prunus* L., *Quercus* L., *Robinia* L., *Salix* L. and *Taxus* L. are host plants of *P. shantungensis*.

There is a derogation for *Robinia pseudoacacia* plants (host plant of *P. shantungensis)* from Türkiye (EU, 2022). A commodity risk assessment for *R. pseudoacacia* plants for planting from Türkiye, indicated with 95% certainty, that between 9,818 and 10,000 plants per 10,000 imported from that country will be free from *P. shantungensis* (EFSA PLH Panel, 2021).

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. Comment on plants for planting as a pathway.

Yes, the pest can enter into the EU territory on plants for planting, cut branches and as a hitchhiker. Plants for planting are the main pathway for *P. shantungensis*.

Potential pathways for *P. shantungensis* are presented in Table 5.

Table 5: Potential entry pathways for *Pochanzia shatungensis* 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]**
Plants for planting of host tress	Eggs, nymphs, adults	2019/2072 Annex VI prohibition; EU 2018/2019 (High risk plants prohibition for some hosts)
Cut branches	Eggs, nymphs, adults	Implementing Regulation 2019/2072, Annex XI, part A e.g. cut branches of *Quercus, Juglans, Prunus* from third countries require a phytosanitary certificate
Hitch-hiking in containers or vehicles	Adults	

The role of plants for plantings as a pathway has been discussed by Zhuravleva et al. (2023), who remark that a large number of plants had been imported from Tuscany in Sotchi (Russia) where *P. shantungensis* had been found. The specimens found in Italy (Stroinski et al., 2022) were precisely found in the Pistoia Province (Tuscany), which they describe as 'the most important nursery area for woody ornamental plants in Italy and one of the biggest in Europe'. Baek et al. (2019a) report that *P. shantungensis* 'had been first found at rest areas of highways in newly invaded areas', which supports the hypothesis that plants for planting and, possibly, hitch-hiking are important entry pathways for the pest.

Notifications of interceptions of harmful organisms began to be compiled in Europhyt in May 1994 and in TRACES in May 2020. As on 24 August 2023, there were no records of interception or outbreak of *P. shantungensis* in the Europhyt and TRACES databases. Nevertheless, there are occurrences of the pest within the EU (see Table 3).

3.4.2. Establishment

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

Yes, as demonstrated in France where a few individuals have been repeatedly found 3 years almost in a row in the same garden in the Alpes-Maritimes department.

In Europe, Italy, Spain, Portugal, Greece, Croatia, Bulgaria, Romania, and Cyprus provide the most suitable conditions for establishment

Climatic mapping is the principal method for identifying areas that could provide suitable conditions for the establishment of a pest taking key abiotic factors into account (Baker, 2002). Availability of hosts is considered in Section 3.4.2.1. Climatic factors are considered in Section 3.4.2.2.

3.4.2.1. EU distribution of main host plants

The widely polyphagous regime of the pest (149 species belonging to 67 families according to EPPO online: see Appendix A.1; 73 additional species according to other sources: Appendix A.2) would allow *P. shantungensis* to find host plants almost anywhere in the EU. Some of these plant species are widely cultivated on the EU territory (see examples in Table 6) and many others are ornamentals.

Table 6: Crop area of some of *Pochazia shantungensis* hosts in the EU in 10,000 ha (Eurostat accessed on 15 June 2023)

Crop	2017	2018	2019	2020	2021
Apples	504.61	506.27	491.08	484.63	492.52
Eggplants	20.73	21.24	20.61	21.33	21.85
Figs	24.63	24.99	25.59	27.63	25.79
Peaches	154.06	150.80	144.78	137.07	133.03
Peppers*	59.50	58.92	59.60	57.63	60.67
Walnuts	74.15	80.60	87.62	99.21	96.62

*: *Capsicum* sp.

3.4.2.2. Climatic conditions affecting establishment

Cfa is the dominant Köppen–Geiger climatic zone in Zhejiang (China) (99.9%) and in a part of the Republic of Korea (20.2%). **Cwa** (38.5%) and **Dwa** (26.3%) are other dominant climatic zones in the Republic of Korea. **Csb** characterises the Alpes Maritimes in France, **Csa** the region of Marmara in Turkey and **Cfa** the Krasnodyarskiy kray in Russia. **Cwa** and **Dwa** are not represented in the EU, but the other zones are, especially in Bulgaria, Croatia, Cyprus, Greece, Italy, Portugal, Romania and Spain.

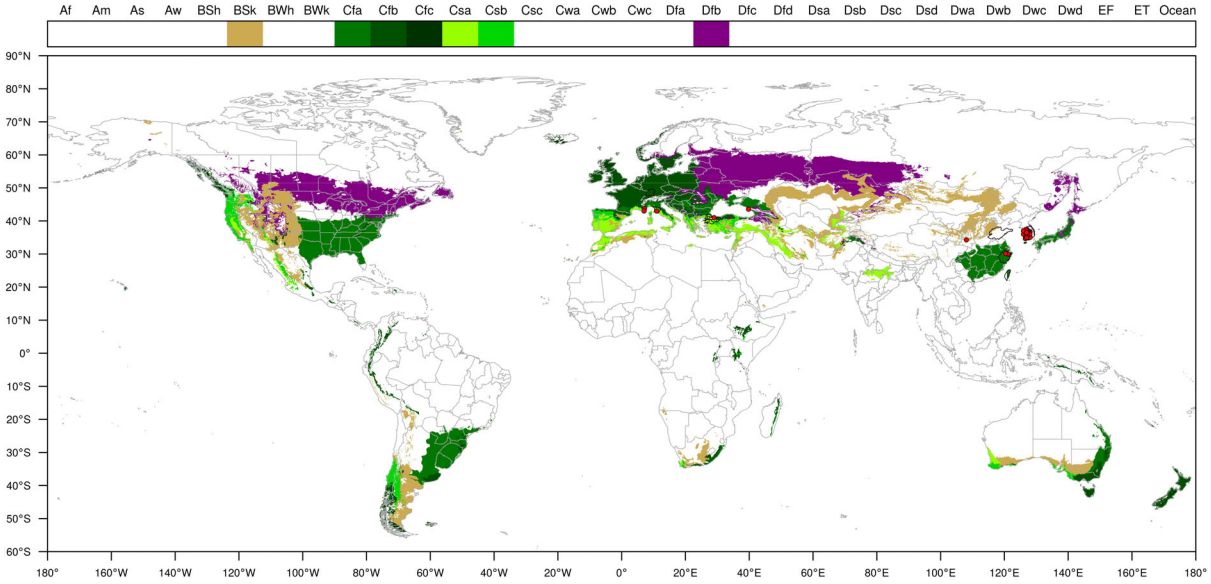

Figure 5: World distribution of eight Köppen–Geiger climate types that occur in the EU and which occur in countries where *Pochazia shantungensis* has been reported

Baek et al. (2019a) used CLIMEX and MaxEnt to predict the current and future distribution of *R. shantungensis* in the Republic of Korea. They found MaxEnt particularly interesting because it also allows introducing non-climatic environmental variables. Using MaxEnt, they identified the maximum temperature of the warmest month, mean annual temperature, mean temperature of the coldest month and precipitation of the driest month as the most important variables explaining the distribution of *R. shantungensis* in the Republic of Korea.

Spread

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

Although nothing is known about the flight capacity of the adults, the recent spread of P. *shantungensis* in the Republic of Korea suggests a high capacity to spread, most likely on infested plants.

Comment on plants for planting as a mechanism of spread.

Plants for planting constitute the major pathway.

P. shantungensis was observed for the first time in 2010 in Gongju and Yesan (Chungcheong-do) in the Republic of Korea (Choi et al., 2011), and has since spread over a very large part of the country (Figure 6). This suggests a very high capacity to multiply and spread. Baek et al. (2019a) report 100% yearly population increases between 2015 and 2017.

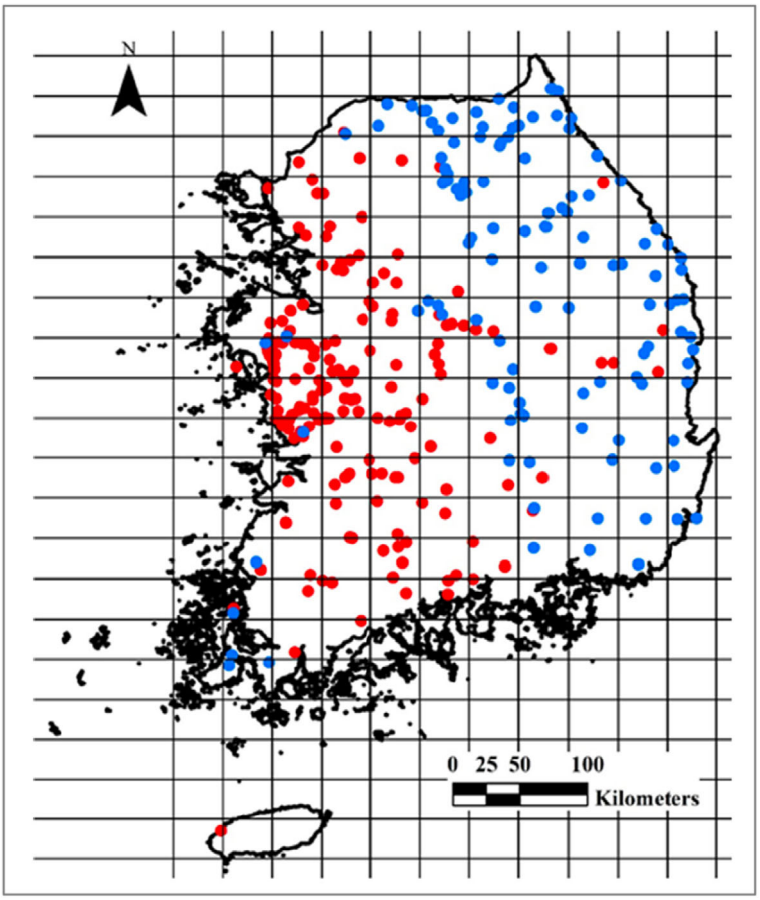

Figure 6: Distribution of *Pochazia shantungensis* in the republic of Korea in 2017. Red dots: presence; blue dots: absence. From Baek et al. (2019a) © 2019 by the authors (CC BY)

3.5. Impacts

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

Yes. The introduction of the pest could cause yield and quality losses on several crops and reduce the value of ornamental plants.

P. shantungensis damages plants by phloem sap-sucking, which deprives the hosts from some of their resources and results in the accumulation of honeydew promoting sooty moulds development. Important damage is also due to the insertion of large numbers of eggs in young branches, which obstructs their vascular system (Bourgoin et al., 2020). Impact on host plants (especially ornamental, but also orchard plants such as persimmons or hazelnuts) could be important. The importance of the damage led to the designing of management (Baek et al., 2021) and sampling (Baek et al., 2020, 2022) directives in the Republic of Korea (Baek et al., 2022). To mitigate damage, Jo et al. (2016), Kim et al. (2016), Lee et al. (2018), Park et al. (2017) and Ryu et al. (2016) propose different chemical treatments, mostly with plant extracts, to repel or kill the pest.

Following reports of the pest in France and Türkiye, the pest which is considered as an important pest in the Republic of Korea and parts of China, was added to the EPPO Alert List in 2021 (EPPO, 2021).

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, prohibition regulations exist for some of the pest's host plants, but the large number of known host plants precludes complete control on entry, and also facilitates establishment and spread.

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 7.

Table 7: 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	Plant or plant product comes from country officially free from pest; Pest-free area; 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
Growing plants in isolation	Description of possible exclusion conditions that could be implemented to isolate the crop from pests and if applicable relevant vectors. E.g. a dedicated structure such as glass or plastic greenhouses; Place of production is insect proof.	Entry/Spread
Biological control and behavioural manipulation	a) Biological control A Scelionid egg parasitoid, *Phanuromyia ricaniae* Nam, Lee & Talamas sp. n. has been reared from the eggs of *P. shantungensis* in China and the Republic of Korea; and described by Nam et al. (2020). The impact of this natural enemy is unknown. b) Mass trapping Kim et al. (2016) report some impact of yellow sticky traps on local population density.	Impact
Chemical treatments on crops including reproductive material	Jo et al. (2016), Kim et al. (2016), Lee et al. (2018), Park et al. (2017), Ryu et al. (2016) propose different chemical treatment, mostly with plant extracts, to repel or kill the pest. None appear totally efficient.	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 treatments addressed in this information sheet are: Spraying/dipping pesticides;	Spread

Control measure/ Risk reduction option (Blue underline = Zenodo doc, Blue = WIP)	RRO summary	Risk element targeted (entry/ establishment/ spread/impact)
	Protective compounds. Jo et al. (2016), Kim et al. (2016), Lee et al. (2018), Park et al. (2017), Ryu et al. (2016) propose different chemical treatment, mostly with plant extracts, to repel or kill the pest. None appear totally efficient.	
Waste management	Treatment of the waste (deep burial, composting, incineration, chipping, production of bio-energy…) in authorised facilities and official restriction on the movement of waste.	Establishment/ Spread/Impact
Conditions of transport	Specific requirements for mode and timing of transport of commodities to prevent escape of the pest and/or contamination. Physical protection of consignment Timing of transport/trade	Entry/Spread

3.6.1.2. Additional supporting measures

Potential additional supporting measures are listed in Table 8.

Table 8: 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	According to ISPM 5 (FAO, 2021) 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. The effectiveness of sampling and subsequent inspection to detect pests may be enhanced by including trapping and luring techniques. • Growing season inspections conducted and no pests or symptoms detected; • No pest or symptoms detected at the place of production since the beginning of the last complete cycle of vegetation; • Inspected prior to export and no pest found or symptoms detected (could include testing)	Establishment/ Spread
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 (FAO, 2008), 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. Baek et al. (2022) developed sampling techniques targeting the eggs of *P. shantungensis* on the twigs of host plants.	Entry/spread

Supporting measure (Blue underline = Zenodo doc, Blue = WIP)	Summary	Risk element targeted (entry/ establishment/ spread/impact)
Phytosanitary certificate and plant passport	According to ISPM 5, 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 (FAO, 2021) 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 (FAO, 2021) 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 to guarantee that plants and produce originate from a pest-free area could be an option.	Entry/Spread

3.6.1.3. Biological or technical factors limiting the effectiveness of measures

The high polyphagy of the pest makes inspection of all susceptible commodities difficult.

3.7. Uncertainty

No key uncertainties have been identified.

4. Conclusions

P. shantungensis is absent from the EU territory, except in limited areas in France, Italy and the Netherlands. It is described as a harmful pest on many different plant species. Phytosanitary measures are available to reduce the likelihood of entry and spread. *P. shantungensis* meets thus the criteria that are within the remit of EFSA to assess for it to be regarded as a potential Union quarantine pest (Table 9).

Table 9: 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 the pest is clearly defined and *Pochazia shantungensis* (Chou & Lu) is the accepted name. 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)	The pest is present in limited areas in France, Italy and the Netherlands.	None
Pest potential for entry, establishment and spread in the EU (Section 3.4)	*P. shantungensis* can further enter into, become established and spread within the EU territory, especially in the southern EU MS. The main pathway is plants for planting.	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 *P. shantungensis* within the EU. Risk reduction options include inspections, chemical 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)	*P. shantungensis* satisfies all the criteria that are within the remit of EFSA to assess for it to be regarded as a potential Union quarantine pest	None
Aspects of assessment to focus on/scenarios to address in future if appropriate:	Given that we only had indirect information regarding impact (i.e. the development of sampling and management practices), a quantitative assessment using data from where the pest occurs could clarify the extent of the pest's impact in the EU.	

References

Baek S. (2019). Spatio-temporal dynamics of *Ricania shantungensis* (Hemiptera: Ricaniidae) in Korea. PhD Thesis, Department of agricultural Biotechnology, Seoul National University, 119 pp.

Baek S and Lee JH, 2021. Spatio-temporal distribution of *Ricania shantungensis* (Hemiptera: Ricaniidae) in chestnut fields: Implications for site-specific management. Journal of Asia-Pacific Entomology, 24(1), 409–414.

Baek S, Kim MJ and Lee JH, 2019a. Current and future distribution of *Ricania shantungensis* (Hemiptera: Ricaniidae) in Korea: Application of spatial analysis to select relevant environmental variables for MaxEnt and CLIMEX modeling. Forests, 10(6), 490. https://doi.org/10.3390/f10060490

Baek S, Koh SH and Lee JH, 2019b. Occurrence model of first instars of *Ricania shantungensis* (Hemiptera: Ricaniidae). Journal of Asia-Pacific Entomology, 22(4), 1040–1045. https://doi.org/10.1016/j.aspen.2019.08.010

Baek S, Lee JH, Park DK, Park Y, Kim MJ, Kim K, Seo H-Y and Choi YS, 2020. Within-tree distribution of *Ricania shantungensis* (Hemiptera: Ricaniidae) eggs on chestnuts. Journal of Asia-Pacific Entomology, 23(2), 536–539.

Baek S, Seo H-Y and Park C-G, 2022. Determination of an optimum sampling unit of *Ricania shantungensis* (Hemiptera: Ricaniidae) eggs in persimmons. PLoS ONE, 17(3), e0265083. https://doi.org/10.1371/journal.pone.0265083

Baker RHA, 2002. Predicting the limits to the potential distribution of alien crop pests. In: GJ Hallman and CP Schwalbe (eds). Invasive Arthropods in Agriculture: problems and solutions. Science Publishers Inc, Enfield, USA. pp. 207–241.

Bourgoin T, 2019. FLOW (Fulgoromorpha Lists on The Web): a world knowledge base dedicated to Fulgoromorpha Version 8, updated [2023-08-03]. Available online: http://www.hemiptera-databases.org/flow/. [Accessed: 8 April 2023]

Bourgoin T, Gros P and Stroinski A, 2020. *Pochazia shantungensis* (Chou & Lu, 1977), an important Asiatic invasive pest on fruit trees, first time reported from France (Hemiptera, Fulgoromorpha, Ricaniidae). Bulletin de la Société Entomologique de France, 125, 271–272.

Choi YS, Hwang IS, Kang TJ, Lim JR, Choe KR, 2011. Oviposition characteristics of *Ricania* sp. (Homoptera: Ricaniidae), a new fruit pest. Korean Journal of Applied Entomology, 50(4), 367-372 (Korean, English summary).

Choi D-S, Ko S-J, Ma K-C, Kim H-J, Lee J-H and Kim D-I, 2016. Effect of temperature on hatchability of overwintering eggs and nymphal development of *Ricania shantungensis* (Hemiptera: Ricaniidae). Korean Journal of Applied Entomology, 55(4), 453–457. (In Korean with English abstract).

Chou I and Lu J-S, 1977. On the Chinese Ricaniidae with descriptions of eight new species. Acta Entomologica Sinica, 20(3), 314–322. (in Chinese)

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, Mac Leod 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, Dehnen-Schmutz, K, Di Serio, F, Gonthier, P, Jacques, M-A, Jaques Miret, JA, Justesen, AF, MacLeod, A, Magnusson, CS, Milonas, P, Navas-Cortes, JA, Parnell, S, Reignault, PL, Thulke, H-H, Van der Werf, W, Vicent Civera, A, Yuen, J, Zappalà, L, Chatzivassiliou, E, Debode, J, Manceau, C, Gardi, C, Mosbach-Schulz, O and Potting, R, 2021. Scientific Opinion on the commodity risk assessment of *Robinia pseudoacacia* plants from *Turkey*. EFSA Journal 2021;19(5):6568, 54 pp. https://doi.org/10.2903/j.efsa.2021.6568

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 Turkey. 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), 2021. *Pochazia shantungensis* (Hemiptera: Ricaniidae): addition to the EPPO Alert List EPPO Reporting Service no. 06–2021 Num. article: 2021/130. Available online: https://gd.eppo.int/reporting/article-7069

EPPO (European and Mediterranean Plant Protection Organization), online. EPPO Global Database. Available online: https://gd.eppo.int [Accessed: 19 September 2020].

European Union, 2022. Commission Implementing Regulation (EU) 2022/490 of 25 March 2022 amending Implementing Regulation (EU) 2018/2019 as regards certain plants for planting of *Juglans regia* L., *Nerium oleander* L. and *Robinia pseudoacacia* L. originating in Turkey, and amending Implementing Regulation (EU) 2020/1213 as regards the phytosanitary measures for the introduction of those plants for planting into the Union territory. Available online: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022R0490&qid=1688549699457. Accessed on 7 August 2023.

FAO (Food and Agriculture Organization of the United Nations), 2008. ISPM (International standards for phytosanitary measures) No 31. Methodologies for sampling of consignments. Available online: https://www.ippc.int/en/publications/83473/

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

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

Hizal E, Oztemiz S and Gjonov I, 2019. *Ricania shantungensis* Chou & Lu 1977 (Hemiptera: Fulgoromorpha: Ricaniidae) a new invasive insect species in European Türkiye. Fresenius Environmental Bulletin, 28(12A), 9816–9820.

Hizal E, Oztemiz S and Gjonov I, 2023. Phenology and Host Preferences of the Invasive *Pochazia shantungensis* (Chou & Lu, 1977) (Hemiptera: Ricaniidae), a Risk for Agriculture and Forest Areas in the West-Palaearctic Region. Acta Zoologica Bulgarica, 75, 251–258.

Jiang Z, Liu J and Qin D, 2019. Sperm ultrastructure of *Pochazia shantungensis* (Chou & Lu) and Ricania speculum (Walker) (Hemiptera, Ricaniidae) with phylogenetic implications. ZooKeys, 880, 43–59. https://doi.org/10.3897/zookeys.880.32810

Jo SH, Ryu TH, Kwon H, Seo MJ, Yu YM, Yasunaga-Aoki C and Youn YN, 2016. Ecological characteristics and environmentally friendly control strategies of *Pochazia shantungensis* (Hemiptera: Ricaniidae) in Korea. Journal of the Faculty of Agriculture, Kyushu University, 61(2), 299–311. https://doi.org/10.5109/1685886

Kang JY, An I and Park S, 2020. The complete mitochondrial genome of *Ricania shantungensis* (Hemiptera: Ricaniidae) in Korea. Mitochondrial DNA Part B, 5(4), 3813–3814. https://doi.org/10.1080/23802359.2020.1840941

Kim DE, Lee H, Kim MJ and Lee D, 2015. Predicting the potential habitat, host plants, and geographical distribution of *Pochazia shantungensis* (Hemiptera: Ricanidae) in Korea. *Korean*. Journal of Applied Entomology, 54(3), 179–118. https://doi.org/10.5656/KSAE.2015.06.0.011

Kim DH, Kim HH, Yang CY, Kang TJ, Yoon JB and Seo MH, 2016. Characteristic of oviposition and effect of density suppression by yellow-colored sticky trap on *Ricania shantungensis* (Hemiptera: Ricaniidae) in blueberry. The Korean. Journal of Pesticide Science, 20(4), 281–285. (Korean, English summary)

Kwon DH, Kim S-J, Kang T-J, Lee JH and Kim DH, 2017. Analysis of the molecular phylogenetics and genetic structure of an invasive alien species, *Ricania shantungensis*, in Korea. Journal of Asia-Pacific Entomology, 20, 901–906.

Lee SK, Jeon SW, Jeong IH, Park SK, Lee SB, Lee HS and Park B, 2018. Insecticidal activity of *Valeriana fauriei* oils extracted by three different methods against *Ricania shantungensis*. Journal of Applied Biological Chemistry, 61 (1), 47–50. (Korean, English summary)

Nam S, Chen HY, Talamas EJ, Lee GS, Dong W, Sun LJ and Lee S, 2020. *Phanuromyia ricaniae* Nam, Lee & Talamas sp. n.(Hymenoptera: Scelionidae) reared from the eggs of *Ricania shantungensis* Chou & Lu (Hemiptera: Ricaniidae) in Asia. *Zootaxa*, 4890(1), 109–118. https://doi.org/10.11646/zootaxa.4890.1.6

Park JH, Jeon YJ, Lee CH, Chung N and Lee HS, 2017. Insecticidal toxicities of carvacrol and thymol derived from *Thymus vulgaris* Lin. against *Pochazia shantungensis* Chou & Lu., newly recorded pest. Scientific Reports, 7(1), 1–7. https://doi.org/10.1038/srep40902

Rahman MA, Kwon YJ, Suh SJ, Youn YN and Jo SH, 2012. The genus *Pochazia* Amyot and Serville (Hemiptera, Ricaniidae) from Korea, with a newly recorded species. Journal of Entomology, 9(5), 239–247.

Ryu TH, Kwon HR, YuU YM and Youn YN, 2016. Repellent effects of peppermint oil against *Pochazia shantungensis* (Hemiptera: ricaniidae). Korean Journal of Applied Entomology, 55(3), 223–233. (Korean, English summary)

Sayers EW, Cavanaugh M, Clark K, Ostell J, Pruitt KD and Karsch-Mizrachi I. 2020. Genbank. Nucleic Acids Research, 48(D1), Issue, 84–86. https://doi.org/10.1093/nar/gkz956

Stroiński A and Bourgoin T, 2022. On the taxonomic position of *Pochazia shantungensis* (Chou & Lu, 1977) (Hemiptera, Fulgoromorpha, Ricaniidae). Bulletin de la Société Entomologique de France, 127(3), 272–274.

Stroiński A, Balderi M, Marraccini D and Mazza G, 2022. First records of *Pochazia shantungensis* (Chou & Lu, 1977) (Hemiptera: Fulgoromorpha: Ricaniidae) in Italy. Zootaxa, 5188(3), 275–282. https://doi.org/10.11646/zootaxa.5188.3.4

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.

Zhang H, Fang W, Zhao X, Jiang X, Stroiński A and Qin D, 2022. Comparative analysis of the complete mitochondrial genomes of five species of Ricaniidae (Hemiptera: Fulgoromorpha) and phylogenetic implications. Biology, 11, 92. https://doi.org/10.3390/biology11010092

Zhuravleva EN, Gnezdilov VM, Tishechkin DY, Mikhailenko AP, Shoshina EI, Karpun NN and Musolin DL, 2023. First records of *Graphocephala fennahi* Young, 1977 and *Pochazia shantungensis* (Chou & Lu, 1977).

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 – *Pochazia shantungensis* host plants/species affected

A.1. Host plants according to the EPPO Global Database (EPPO, online).

Host status	Host name	Plant family	Common name	References
Cultivated hosts	*Acer palmatum*	Sapindaceae	Japanese maple	EPPO, (online), Kim et al. (2015)
	Acer pictum subsp. *mono*	Sapindaceae	Mono maple	EPPO (online), Kim et al. (2015)
	Acer triflorum	Sapindaceae	Rough-barked maple	EPPO (online), Kim et al. (2015)
	Achyranthes japonica	Amaranthaceae	Japanese chaff flower	EPPO (online), Kim et al. (2015)
	Ailanthus altissima	Simaroubaceae	Ailanthus	EPPO (online), Kim et al. (2015)
	Albizia julibrissin	Fabaceae	Persian acacia	EPPO (online), Kim et al. (2015)
	Alnus japonica	Betulaceae	Japanese alder	EPPO (online), Kim et al. (2015)
	Amorpha fruticosa	Fabaceae	Bastard indigo	EPPO (online), Kim et al. (2015)
	Ampelopsis brevipedunculata var. *maximowiczii*	Vitaceae	–	EPPO (online), Kim et al. (2015)
	Amphicarpaea edgeworthii	Fabaceae	–	EPPO (online), Kim et al. (2015)
	Angelica polymorpha	Apiaceae	–	EPPO (online), Kim et al. (2015)
	Arachniodes aristata	Polypodiaceae	Prickly shield fern	EPPO (online), Kim et al. (2015)
	Aralia elata	Araliaceae	Japanese angelica tree	EPPO (online), Kim et al. (2015)
	Aspidistra sp.	Asparagaceae	–	EPPO (online), Stroiński et al. (2022)
	Aster scaber	Asteraceae	–	EPPO (online), Kim et al. (2015)
	Aster yomena	Asteraceae	–	EPPO (online), Kim et al. (2015)
	Bignonia sp.	Bignoniaceae	–	EPPO (online), Stroiński et al. (2022)
	Boehmeria longispica	Urticaceae	–	EPPO (online), Kim et al. (2015)
	Boehmeria platanifolia	Urticaceae	Sycamore-leaf false nettle	EPPO (online), Kim et al. (2015)
	Boehmeria tricuspis	Urticaceae	–	EPPO (online), Kim et al. (2015)
	Bothriochloa ischaemum	Poaceae	Bearded finger-grass	EPPO (online), Kim et al. (2015)
	Broussonetia kazinoki	Moraceae	Paper mulberry	EPPO (online), Kim et al. (2015)
	Brucea javanica	Simaroubaceae	Java brucea	EPPO (online), Kim et al. (2015)

Host status	Host name	Plant family	Common name	References
	Callicarpa japonica	Lamiaceae	Japanese beautyberry	EPPO (online), Kim et al. (2015)
	Camellia japonica	Theaceae	Camellia	EPPO (online), Kim et al. (2015)
	Capsicum annuum	Solanaceae	Bell pepper	EPPO (online), Kim et al. (2015)
	Castanea crenata	Fagaceae	Japanese chestnut	EPPO (online), Kim et al. (2015)
	Catalpa bungei	Bignoniaceae	Catalpa	Schrader (2021)
	Chaenomeles japonica	Rosaceae	Japanese flowering quince	EPPO (online), Kim et al. (2015)
	Chenopodium giganteum	Amaranthaceae	Bengal cane	EPPO (online), Kim et al. (2015)
	Chionanthus retusus	Oleaceae	Chinese fringe tree	EPPO (online), Kim et al. (2015)
	Cirsium japonicum	Asteraceae	Japanese thistle	EPPO (online), Kim et al. (2015)
	Citrus spp.	Rutaceae	Citrus	EPPO (online), Stroiński et al. (2022)
	Clematis apiifolia	Ranunculaceae	–	EPPO (online), Kim et al. (2015)
	Commelina communis	Commelinaceae	Asiatic dayflower	EPPO (online), Kim et al. (2015)
	Corchoropsis crenata	Malvaceae	–	EPPO (online), Kim et al. (2015)
	Cornus controversa	Cornaceae	Giant dogwood	EPPO (online), Kim et al. (2015)
	Cornus officinalis	Cornaceae	Japanese cornel	EPPO (online), Kim et al. (2015)
	Corydalis raddeana	Papaveraceae	–	EPPO (online), Kim et al. (2015)
	Corylus heterophylla	Corylaceae	Japanese hazel	EPPO (online), Kim et al. (2015)
	Cucurbita moschata	Cucurbitaceae	Canada crookneck	EPPO (online), Kim et al. (2015)
	Cyperus microiria	Cyperaceae	Asian flatsedge	EPPO (online), Kim et al. (2015)
	Dioscorea polystachya	Dioscoreaceae	Chinese yam	EPPO (online), Kim et al. (2015)
	Diospyros kaki	Ebenaceae	Chinese date plum	EPPO (online), Kim et al. (2015)
	Diospyros lotus	Ebenaceae	Caucasian persimmon	EPPO (online), Kim et al. (2015)
	Echinochloa crus-galli	Poaceae	Barnyard grass	EPPO (online), Kim et al. (2015)
	Eleutherococcus sessiliflorus	Araliaceae	–	EPPO (online), Kim et al. (2015)
	Erechtites hieraciifolius	Asteraceae	American burnweed	EPPO (online), Kim et al. (2015)
	Erigeron annuus	Asteraceae	Annual fleabane	EPPO (online), Kim et al. (2015)

Host status	Host name	Plant family	Common name	References
	Erigeron canadensis	Asteraceae	Butterweed	EPPO (online), Kim et al. (2015)
	Eucommia ulmoides	Eucommiaceae	Gutta percha tree	EPPO (online), Kim et al. (2015)
	Euonymus alatus	Celastraceae	Burning bush	EPPO (online), Kim et al. (2015)
	Euonymus japonicus	Celastraceae	Evergreen spindle	EPPO (online), Kim et al. (2015)
	Ficus carica	Moraceae	Common fig	EPPO (online), Stroiński et al. (2022)
	Flueggea suffruticosa	Phyllanthaceae	–	EPPO (online), Kim et al. (2015)
	Forsythia koreana	Oleaceae	–	EPPO (online), Kim et al. (2015)
	Ginkgo biloba	Ginkgoaceae	Ginkgo	EPPO (online), Kim et al. (2015)
	Helianthus annuus	Asteraceae	Common sunflower	EPPO (online), Kim et al. (2015)
	Hemiptelea davidii	Ulmaceae	Hemiptelea	EPPO (online), Kim et al. (2015)
	Hibiscus syriacus	Malvaceae	Althaea	EPPO (online), Kim et al. (2015)
	Hovenia dulcis	Rhamnaceae	Japanese raisin	EPPO (online), Kim et al. (2015)
	Humulus scandens	Cannabaceae	Asian hop	EPPO (online), Kim et al. (2015)
	Ilex rotunda	Aquifoliaceae	Kurogane holly	EPPO (online), Kim et al. (2015)
	Ilex sp.	Aquifoliaceae	–	EPPO (online), Stroiński et al. (2022)
	Impatiens textori	Balsaminaceae	–	EPPO (online), Kim et al. (2015)
	Juglans regia	Juglandaceae	Common walnut	EPPO (online), Kim et al. (2015)
	Kalopanax septemlobus	Araliaceae	Castor aralia	EPPO (online), Kim et al. (2015)
	Koelreuteria paniculata	Sapindaceae	Chinese varnish tree	EPPO (online), Kim et al. (2015)
	Lagerstroemia indica	Lythraceae	cannonball	EPPO (online), Kim et al. (2015)
	Lespedeza bicolor	Fabaceae	Bicolor lespedeza	EPPO (online), Kim et al. (2015)
	Ligustrum japonicum	Oleaceae	Japanese privet	EPPO (online), Kim et al. (2015)
	Ligustrum lucidum	Oleaceae	Broad-leaf privet	EPPO (online), Hizal et al. (2019)
	Ligustrum vulgare	Oleaceae	Common privet	EPPO (online), Stroiński et al. (2022)
	Liquidambar styraciflua	Altingiaceae	American sweet gum	EPPO (online), Hizal et al. (2019)
	Lycium chinense	Solanaceae	China tea plant	EPPO (online), Kim et al. (2015)

Host status	Host name	Plant family	Common name	References
	Maackia amurensis	Fabaceae	Amur maackia	EPPO (online), Kim et al. (2015)
	Machilus thunbergii	Lauraceae	Makko	EPPO (online), Kim et al. (2015)
	Maclura tricuspidata	Moraceae	Mandarin melon berry	EPPO (online), Kim et al. (2015)
	Magnolia grandiflora	Magnoliaceae	Bull bay	EPPO (online), Stroiński et al. (2022)
	Malus domestica	Rosaceae	Apple	EPPO (online), Kim et al. (2015)
	Morus alba	Moraceae	Silkworm mulberry	EPPO (online), Kim et al. (2015)
	Myosoton aquaticum	Caryophyllaceae	Water chickweed	EPPO (online), Kim et al. (2015)
	Oenothera biennis	Onagraceae	Common evening primrose	EPPO (online), Kim et al. (2015)
	Olea europaea	Oleaceae	Common olive	EPPO (online), Stroiński et al. (2022)
	Oplismenus undulatifolius	Poaceae	Australian basketgrass	EPPO (online), Kim et al. (2015)
	Osmanthus fragrans	Oleaceae	Fragrant olive	EPPO (online), Kim et al. (2015)
	Paulownia tomentosa	Paulowniaceae	Foxglove tree	EPPO (online), Kim et al. (2015)
	Perilla frutescens var. *crispa*	Lamiaceae	Beefsteak plant	EPPO (online), Kim et al. (2015)
	Persicaria senticosa	Polygonaceae	–	EPPO (online), Kim et al. (2015)
	Persicaria thunbergii	Polygonaceae	–	EPPO (online), Kim et al. (2015)
	Petasites japonicus	Asteraceae	Creamy butterbur	EPPO (online), Kim et al. (2015)
	Phytolacca americana	Phytolaccaceae	American poke	EPPO (online), Kim et al. (2015)
	Pinellia ternata	Araceae	East African arum	EPPO (online), Kim et al. (2015)
	Pittosporum sp.	Pittosporaceae	–	EPPO (online), Stroiński et al. (2022)
	Platycladus orientalis	Cupressaceae	Arbor-vitae	EPPO (online), Kim et al. (2015)
	Polygonum perfoliatum	Polygonaceae	Asiatic tearthumb	EPPO (online), Kim et al. (2015)
	Populus sp.	Salicaceae	–	EPPO (online), Kim et al. (2015)
	Pourthiaea villosa	Rosaceae	–	EPPO (online), Kim et al. (2015)
	Prunus domestica	Rosaceae	European plum	EPPO (online), Stroiński et al. (2022)
	Prunus mume	Rosaceae	Japanese apricot	EPPO (online), Kim et al. (2015)

Host status	Host name	Plant family	Common name	References
	Prunus persica	Rosaceae	Peach	EPPO (online), Kim et al. (2015)
	Prunus serrulata var. *pubescens*	Rosaceae	Korean mountain cherry	EPPO (online), Kim et al. (2015)
	Prunus serrulata var. *spontanea*	Rosaceae	Japanese hill cherry	EPPO (online), Kim et al. (2015)
	Pseudocydonia sinensis	Rosaceae	Chinese quince	EPPO (online), Kim et al. (2015)
	Pueraria montana var. *lobata*	Fabaceae	Japanese arrowroot	EPPO (online), Kim et al. (2015)
	Pyrus calleryana	Rosaceae	Bradford pear	EPPO (online), Kim et al. (2015)
	Quercus acutissima	Fagaceae	Japanese chestnut oak	EPPO (online), Kim et al. (2015)
	Quercus aliena	Fagaceae	Japanese white oak	EPPO (online), Kim et al. (2015)
	Quercus serrata	Fagaceae	Gland-bearing oak	EPPO (online), Kim et al. (2015)
	Rhamnella franguloides	Rhamnaceae	–	EPPO (online), Kim et al. (2015)
	Rhododendron indicum	Ericaceae	Satsuki azalea	EPPO (online), Kim et al. (2015)
	Rhododendron schlippenbachii	Ericaceae	Royal azalea	EPPO (online), Kim et al. (2015)
	Rhododendron yedoense	Ericaceae	Yodogawa azalea	EPPO (online), Kim et al. (2015)
	Ricinus communis	Euphorbiaceae	Castor bean	EPPO (online), Kim et al. (2015)
	Robinia pseudoacacia	Fabaceae	Black locust	EPPO (online)
	Rosa sp.	Rosaceae	–	EPPO (online), Stroiński et al. (2022)
	Rosa multiflora	Rosaceae	Baby rose	EPPO (online), Kim et al. (2015)
	Rubus coreanus	Rosaceae	–	EPPO (online), Kim et al. (2015)
	Rubus crataegifolius	Rosaceae	Hawthorn raspberry	EPPO (online), Kim et al. (2015)
	Rubus idaeus	Rosaceae	European red raspberry	EPPO (online), Stroiński et al. (2022)
	Rubus ikenoensis	Rosaceae	–	EPPO (online), Kim et al. (2015)
	Rubus parvifolius	Rosaceae	Japanese raspberry	EPPO (online), Kim et al. (2015)
	Rubus sp.	Rosaceae	–	EPPO (online), Stroiński et al. (2022)
	Rumex crispus	Polygonaceae	Curled dock	EPPO (online), Kim et al. (2015)
	Salix chaenomeloides	Salicaceae	Giant pussy willow	EPPO (online), Kim et al. (2015)

Host status	Host name	Plant family	Common name	References
	Salix gracilistyla	Salicaceae	Big catkin willow	EPPO (online), Kim et al. (2015)
	Salix pierotii	Salicaceae	–	EPPO (online), Kim et al. (2015)
	Setaria viridis	Poaceae	Bottlegrass	EPPO (online), Kim et al. (2015)
	Smilax china	Smilacaceae	China root	EPPO (online), Kim et al. (2015)
	Solanum melongena	Solanaceae	Aubergine	EPPO (online), Kim et al. (2015)
	Stephanandra incisa	Rosaceae	Cut-leaf stephanandra	EPPO (online), Kim et al. (2015)
	Stewartia pseudocamellia	Theaceae	Japanese silky camellia	EPPO (online), Kim et al. (2015)
	Styrax japonicus	Styracaceae	Japanese snowbell	EPPO (online), Kim et al. (2015)
	Symplocos paniculata	Symplocaceae	Asiatic sweet-leaf	EPPO (online), Kim et al. (2015)
	Syringa oblata	Oleaceae	–	EPPO (online), Kim et al. (2015)
	Taxus cuspidata	Taxaceae	Japanese yew	EPPO (online), Kim et al. (2015)
	Toxicodendron sylvestre	Anacardiaceae	–	EPPO (online), Kim et al. (2015)
	Toxicodendron trichocarpum	Anacardiaceae	–	EPPO (online), Kim et al. (2015)
	Vaccinium	Ericaceae	–	EPPO (online), Kim et al. (2015)
	Veronica persica	Plantaginaceae	Bird's-eye speedwell	EPPO (online), Kim et al. (2015)
	Viburnum erosum	Adoxaceae	Beech viburnum	EPPO (online), Kim et al. (2015)
	Vitis flexuosa	Vitaceae	–	EPPO (online), Kim et al. (2015)
	Vitis labrusca	Vitaceae	American grape	EPPO (online), Stroiński et al. (2022)
	Vitis vinifera	Vitaceae	Common grapevine	EPPO (online), Stroiński et al. (2022)
	Weigela subsessilis	Caprifoliaceae	–	EPPO (online), Kim et al. (2015)
	Zanthoxylum piperitum	Rutaceae	Japanese pepper tree	EPPO (online), Kim et al. (2015)
	Zanthoxylum schinifolium	Rutaceae	Chinese prickly ash	EPPO (online), Kim et al. (2015)
	Zelkova serrata	Ulmaceae	Japanese zelkova	EPPO (online), Kim et al. (2015)
	Ziziphus jujuba var. *inermis*	Rhamnaceae	Smooth jujube	EPPO (online), Kim et al. (2015)
Wild weed hosts				
Artificial/ experimental host				

A.2. Additional host plants identified in the sources indicated

Host plants	Sources
Acca sellowiana	Hizal et al. (2023)
Acer campestre	Hizal et al. (2023)
Acer negundo	Hizal et al. (2023)
Amphicarpaea bracteata	Kim et al. (2015)
Berberis aquifolium	Hizal et al. (2023)
Calycanthus floridus	Hizal et al. (2023)
Carpinus betulus	Hizal et al. (2023)
Catalpa bignonioides	Hizal et al. (2023)
Cedrela sinensis	Jo et al. (2016)
Cercis chinensis	Kwon et al. (2017)
Cercis siliquastrum	Hizal et al. (2023)
Chaenomeles sinensis	Kim et al. (2015)
Chenopodium album	Kim et al. (2015)
Citrus japonica	Hizal et al. (2023)
Conyza canadensis	Kim et al. (2015)
Corchoropsis psilocarpa	Kim et al. (2015)
Corydalis ochotensis	Kim et al. (2015)
Corylus avellana	Hizal et al. (2023)
Corylus maxima	Hizal et al. (2023)
Cotoneaster lacteus	Hizal et al. (2023)
Crataegus sp.	Kim et al. (2015)
Cudrania tricuspidata	Kim et al. (2015)
Cydonia oblonga	Hizal et al. (2023)
Dioscorea batatus	Kim et al. (2015)
Diospyros sp.	Kim et al. (2015)
Elaeagnus angustifolia	Hizal et al. (2023)
Elaeagnus pungens	Hizal et al. (2023)
Eriobotrya japonica	Hizal et al. (2023)
Euryops pectinatus	Hizal et al. (2023)
Fagus sylvatica	Hizal et al. (2023)
Gleditsia triacanthos	Hizal et al. (2023)
Hedera helix	Hizal et al. (2023)
Humulus japonicus	Kim et al. (2015)
Jasminum officinale	Hizal et al. (2023)
Laurus nobilis	Hizal et al. (2023)
Liriodendron tulipifera	Hizal et al. (2023)
Lonicera japonica	Hizal et al. (2023)
Malus floribunda	Hizal et al. (2023)
Malus pumila	Kim et al. (2015)
Nerium oleander	Hizal et al. (2023)
Paulownia coreana	Kim et al. (2015)
Persicaria perfoliata	Kim et al. (2015)
Phormium tenax	Hizal et al. (2023)
Pittosporum tobira	Hizal et al. (2023)
Platanus acerifolia	Hizal et al. (2023)
Platanus orientalis	Hizal et al. (2023)
Populus tomentiglandulosa	Kim et al. (2015)

Host plants	Sources
Prunus avium	Hizal et al. (2023)
Prunus laurocerasus	Hizal et al. (2023)
Prunus serrulata	Kim et al. (2015)
Prunus verecunda	Kim et al. (2015)
Pueraria lobata	Kim et al. (2015)
Pueraria montana	Kwon et al. (2017)
Punica granatum	Hizal et al. (2023)
Pyracantha coccinea	Hizal et al. (2023)
Quercus robur	Hizal et al. (2023)
Rhus chinensis	Kwon et al. (2017)
Rhus javanica	Kim et al. (2015)
Rhus sylvestris	Kim et al. (2015)
Rhus tricocarpa	Kim et al. (2015)
Rubus vestitus	Hizal et al. (2023)
Salix koreensis	Hizal et al. (2023)
Schisandra chinensis	Jo et al. (2016)
Securinega suffruticosa	Kim et al. (2015)
Stellaria aquatica	Kim et al. (2015)
Symplocos chinensis	Kim et al. (2015)
Thuja orientalis	Kim et al. (2015)
Tilia tomentosa	Hizal et al. (2023)
Toxicodendron vernicifluum	Kwon et al. (2017)
Vaccinium corymbosum	Kwon et al. (2017)
Viburnum opulus	Hizal et al. (2023)
Viburnum tinus	Hizal et al. (2023)
Vitex agnus-castus	Hizal et al. (2023)

Appendix B – Distribution of *Pochazia shantungensis*

Distribution records based on EPPO Global Database (EPPO, online).

Region	Country	Sub-national (e.g. State)	Status	References
EU (27)	France	Alpes-Maritimes department in the Provence-Alpes-Côte d'Azur region	Transient, actionable, under eradication	EPPO (online)
	Germany	Baden-Württemberg	Eradicated	EPPO (online)
	Italy	Tuscany Region, Pistoia Province	Present, few occurrences	EPPO (online), Stroiński et al. (2022)
	Netherlands	IJsselmonde, Western Netherlands	Transient, non-actionable. Few specimens at one location, monitoring ongoing.	EPPO (online)
Asia	China		Present, no details	EPPO (online); Bourgoin (2021)
		Shaanxi	Present, no details	Jiang et al. (2019)
		Shandong	Present, no details	EPPO (online), Chou and Lu (1977), Kwon et al. (2017)
		Zhejiang	Present, widespread	EPPO (online), Bourgoin et al. (2020)
	Korea, Republic		Present, no details	EPPO (online), Baek (2015), Bourgoin (2021)
	Russia	Southern Russia	Present, restricted distribution	EPPO (online), Zhuravleva et al. (2023)
	Türkiye	Marmara and Istanbul region	Present, restricted distribution	EPPO (online), Hizal et al. (2019), Bourgoin (2021)