



The Food & Environment Research Agency

Rapid Pest Risk Analysis (PRA) for

Japananus hyalinus

STAGE 1: INITIATION

1. What is the name of the pest?

Japananus hyalinus (Osborn) Hemiptera Cicadellidae Japanese maple leafhopper

Synonyms: *Japananus meridionalis* Bonfils
Platymetopius cinctus Matsumura
Platymetopius hyalinus Osborn

2. What initiated this rapid PRA?

In 1999 two leafhoppers identified as *J. hyalinus* were intercepted on *Acer palmatum* 'Katsura' imported from South Korea. An entry for this species was included on the UK Plant Health Pest Risk Register in 2013 and identified as a priority to update a previous PRA written in 1999 (Fera 2013), in particular to assess its potential establishment given the spread of *J. hyalinus* across Europe (Mifsud et al. 2010).

3. What is the PRA area?

The PRA area is the United Kingdom of Great Britain and Northern Ireland.

STAGE 2: RISK ASSESSMENT

4. What is the pest's status in the EC Plant Health Directive (Council Directive 2000/29/EC¹) and in the lists of EPPO²?

The pest is not listed in the EC Plant Health Directive and is not recommended for regulation as a quarantine pest by EPPO, nor is it on the EPPO Alert List.

5. What is the pest's current geographical distribution?

J. hyalinus was first identified from the USA, but it is widely believed to originate from eastern Asia, though some authors dispute this due to the main host plant in Europe being the native *Acer campestre*, rather than ornamentally grown Asian species (Nickel and Remane 2002). It was first introduced into Europe in Austria in 1961, but its range has expanded considerably in recent years (Mifsud et al. 2010).

North America:	Canada, USA (George 1959)
Central America:	No records
South America:	No records
Europe:	Austria, Bulgaria, Czech Republic, France, Germany, Hungary, Italy, Montenegro, Romania, Russia, Serbia, Slovenia, Slovakia, Spain,

¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2000L0029:20100113:EN:PDF>

² <https://www.eppo.int/QUARANTINE/quarantine.htm>

	Switzerland (Mifsud et al. 2010) and Poland (Walczak et al. 2012)
Africa:	No records
Asia:	China, India, Japan, Korea (Xing et al. 2008).
Oceania:	Australia (Fletcher and Knight 1998)

6. Is the pest established or transient, or suspected to be established/transient in the UK/PRA Area?

In 1999 two *J. hyalinus* were intercepted on *A. palmatum* that originated from South Korea. In August 2014 a single adult was observed on an *Aster amellus* (Michaelmas Daisy) in Cambridge – the plant was located directly underneath an ornamental *Acer* (Keith Edkins, *pers comm.* 16.09.2014). Given the distinctive nature of this leafhopper it was confirmed as *Japananus hyalinus* from photographs (Chris Malumphy *pers. comm.* 16.09.2014). It is not yet known if this specimen is part of an established population, or a single incursion.

7. What are the pest’s natural and experimental host plants; of these, which are of economic and/or environmental importance in the UK/PRA area?

Japananus hyalinus has been associated with eleven *Acer* species (see Table 2). The main host plants in Asia are *A. japonicum* and *A. palmatum* (Walczak et al. 2012) but in Europe it is found extensively on field maple, *A. campestre* (Nickel and Remane 2002).

Table 2: Species of *Acer* that are known hosts of *J. hyalinus*.

Host Name	Common Name	Reference
<i>Acer campestre</i>	Field maple	(Nickel and Remane 2002)
<i>Acer japonicum</i>	Fullmoon maple	(Arzone and Vidano 1990)
<i>Acer palmatum</i>	Japanese maple	(Walczak et al. 2012)
<i>Acer negundo</i>	Box-elder	(Arzone and Vidano 1990)
<i>Acer platanoides</i>	Norway maple	(George 1959)
<i>Acer pseudoplatanus</i>	Sycamore	(Arzone and Vidano 1990)
<i>Acer saccharinum</i>	Silver maple	(Arzone and Vidano 1990)
<i>Acer monspessulanum</i>	Montpellier maple	(Seljak 2002)
<i>Acer buergerianum</i>	Trident maple	(Xing et al. 2008)
<i>Acer truncatum</i>	Shantung maple	(Xing et al. 2008)
<i>Acer rubrum</i>	Red maple	(Bentz and Townsend 2005)

There are also records of *J. hyalinus* collected from sticky traps placed in the foliage of *Prunus cerasus* (sour cherry) (George 1959) and *Quercus palustris* (pin oak) (Arzone and Vidano 1990).

Various *Acer* species are important to the UK. *Acer campestre* is a widespread native tree, and *A. pseudoplatanus* and *A. platanoides* are planted widely as amenity trees. Various Asian species of *Acer* are also sold as ornamentals.

8. What pathways provide opportunities for the pest to enter and transfer to a suitable host and what is the likelihood of entering the UK/PRA area? (By pathway):

Plants for Planting: It is widely believed that *J. hyalinus* was introduced to the USA via ornamental plants of Asian *Acer* species, and the interception of this leafhopper on planting material in the UK shows it does move along this pathway. The eggs of *J. hyalinus* are inserted into the nodes of young branches (Arzone and Vidano 1990) where they are very difficult to detect, and this allows *J. hyalinus* to move in dormant planting stock. Given the increasing distribution of *J. hyalinus* across Europe from which there is trade in ornamental *Acer*, *J. hyalinus* is considered likely to enter on planting material.

Natural Spread: *J. hyalinus* has spread into several other European countries since it was first recorded in Austria in 1961, but new country records are much more likely to be due to movement with planting material than natural spread. Within Europe, it is currently found as far north as North Rhine-Westphalia in Germany (Robert Biedermann and Niedringhaus 2009), but may be more widespread than reported. There are no data on the flight capabilities of *J. hyalinus* in the literature but it is not recorded as a migratory species, and thus entry by natural spread is considered unlikely.

Plants for Planting	Very unlikely	<input type="checkbox"/>	Unlikely	<input type="checkbox"/>	Moderately likely	<input type="checkbox"/>	Likely	<input checked="" type="checkbox"/>	Very likely	<input type="checkbox"/>
Confidence	High Confidence	<input checked="" type="checkbox"/>	Medium Confidence	<input type="checkbox"/>	Low Confidence	<input type="checkbox"/>				
Natural Spread	Very unlikely	<input type="checkbox"/>	Unlikely	<input checked="" type="checkbox"/>	Moderately likely	<input type="checkbox"/>	Likely	<input type="checkbox"/>	Very likely	<input type="checkbox"/>
Confidence	High Confidence	<input checked="" type="checkbox"/>	Medium Confidence	<input type="checkbox"/>	Low Confidence	<input type="checkbox"/>				

9. How likely is the pest to establish outdoors or under protection in the UK/PRA area?

Japananus hyalinus has shown the ability to be able to establish in a wide range of climate zones and it occurs in regions with climates similar to the UK. One adult was found outside in the UK for the first time in 2014, but it is not known if this is an isolated case or part of a transient or established population. In Japan it is found on both Honshu and the more northerly Hokkaido (Xing et al. 2008). In North America it is recorded from North Carolina in the south (Anon 2014) to Ontario in the North (George 1959).

Japananus hyalinus overwinters as an egg and is currently present in areas with colder winters than the UK, but many also have hotter summers. No specific data on temperature requirements for this species are available. North Rhine-Westphalia in Germany, where *J. hyalinus* has been recorded, has a climate similar to the UK. Both have Köppen-Geiger climate classifications of Cfb (warm temperate climate, fully humid with a warm summer)(Kottek et al. 2006). It is considered likely to be able to establish outdoors across much of the UK, probably with a single generation as is seen in most areas of Europe. This is with medium confidence, as it is unclear exactly how far north *J. hyalinus* is within Europe, and climate may limit its spread north. It is also unclear if a single outdoor finding in Cambridge represents an individual from an established population. If so the establishment potential outdoors would be very likely.

The hosts of *J. hyalinus* are not normally grown under protection, though some ornamental species and artificially dwarfed *Acer* are grown indoors. This species is not recorded as a pest of protected cultivation and is considered unlikely to establish under protection.

Outdoors	Very unlikely	<input type="checkbox"/>	Unlikely	<input type="checkbox"/>	Moderately likely	<input type="checkbox"/>	Likely	<input checked="" type="checkbox"/>	Very likely	<input type="checkbox"/>
Confidence	High Confidence	<input type="checkbox"/>	Medium Confidence	<input checked="" type="checkbox"/>	Low Confidence	<input type="checkbox"/>				
Under Protection	Very unlikely	<input type="checkbox"/>	Unlikely	<input checked="" type="checkbox"/>	Moderately likely	<input type="checkbox"/>	Likely	<input type="checkbox"/>	Very likely	<input type="checkbox"/>
Confidence	High Confidence	<input checked="" type="checkbox"/>	Medium Confidence	<input type="checkbox"/>	Low Confidence	<input type="checkbox"/>				

10. If the pest needs a vector, is it present in the UK/PRA area?

Japananus hyalinus is a free living organism and no vector is required.

11. How quickly could the pest spread in the UK/PRA area?

There are no published data on the flight capacity of *J. hyalinus*. Though it has spread within areas where it has been introduced such as North America and Europe, it is not possible to differentiate new records caused by natural spread and those associated with the imports of plants for planting. Populations may also go unnoticed for long periods of time due to the lack of damage, and the cryptic colouring of the leafhoppers (Arzone et al. 1987). Generally, most species of Auchenorrhyncha (the sub-order to which leafhoppers belong) are quite sedentary and move less than 2 km from their hatching site. Some species form 'migratory morphs' capable of long distance flight (Dietrich 2009) but this has not been recorded in *J. hyalinus*. Natural spread in the UK is predicted to be slow, with medium confidence due to the lack of specific data about the flight capacity of the pest.

Eggs of *J. hyalinus* laid under into the nodes of young branches of ornamental *Acer* trees could be spread quickly in trade.

Natural Spread	Very slowly <input type="checkbox"/>	Slowly <input checked="" type="checkbox"/>	Moderate pace <input type="checkbox"/>	Quickly <input type="checkbox"/>	Very quickly <input type="checkbox"/>
Confidence	High Confidence <input type="checkbox"/>	Medium Confidence <input checked="" type="checkbox"/>	Low Confidence <input type="checkbox"/>		
With trade	Very slowly <input type="checkbox"/>	Slowly <input type="checkbox"/>	Moderate pace <input type="checkbox"/>	Quickly <input checked="" type="checkbox"/>	Very quickly <input type="checkbox"/>
Confidence	High Confidence <input checked="" type="checkbox"/>	Medium Confidence <input type="checkbox"/>	Low Confidence <input type="checkbox"/>		

12. What is the pest's economic, environmental and social impact within its existing distribution?

Japananus hyalinus is a phloem feeding leafhopper. In most regions it has been reported as having a single generation a year (Arzone et al. 1987) but in Italy it has two (Arzone and Vidano 1990). Despite being an introduced non-native species in many parts of its current distribution no impacts of any kind have been reported in Europe (Mifsud et al. 2010), Australia (Anon) or the USA. Despite the fact that it is noted to be sometimes found in high abundance on its host plants, they are described as having "symptoms of sufferance missing", though it is unclear what type of damage the authors are referring to (Arzone et al. 1987; Dickerson et al. 1919). It is found regularly in association with European native trees such as *A. campestre* (Nickel and Remane 2002), but no environmental impacts have been noted. Thus *J. hyalinus* is given an impact rating of very small.

Impacts	Very small <input checked="" type="checkbox"/>	Small <input type="checkbox"/>	Medium <input type="checkbox"/>	Large <input type="checkbox"/>	Very large <input type="checkbox"/>
Confidence	High Confidence <input checked="" type="checkbox"/>	Medium Confidence <input type="checkbox"/>	Low Confidence <input type="checkbox"/>		

13. What is the pest's potential to cause economic, environmental and social impacts in the UK/PRA area?

Given the lack of impacts recorded anywhere in its current range where it feeds on trees of economic and environmental importance to the UK, potential economic, environmental and social impacts in the UK are all rated as very small. It is possible that within the current range of *J. hyalinus* there are natural enemies which control the populations - such enemies may be absent from the UK leading to increased impacts, but this is unlikely since high populations have been recorded elsewhere in the leafhopper's distribution without any impacts. All potential impacts in the UK are scores as very small with high confidence.

Economic Impacts	Very small	<input checked="" type="checkbox"/>	Small	<input type="checkbox"/>	Medium	<input type="checkbox"/>	Large	<input type="checkbox"/>	Very large	<input type="checkbox"/>
Confidence	High Confidence	<input checked="" type="checkbox"/>	Medium Confidence	<input type="checkbox"/>	Low Confidence	<input type="checkbox"/>				
Environ - mental Impacts	Very small	<input checked="" type="checkbox"/>	Small	<input type="checkbox"/>	Medium	<input type="checkbox"/>	Large	<input type="checkbox"/>	Very large	<input type="checkbox"/>
Confidence	High Confidence	<input checked="" type="checkbox"/>	Medium Confidence	<input type="checkbox"/>	Low Confidence	<input type="checkbox"/>				
Social Impacts	Very small	<input checked="" type="checkbox"/>	Small	<input type="checkbox"/>	Medium	<input type="checkbox"/>	Large	<input type="checkbox"/>	Very large	<input type="checkbox"/>
Confidence	High Confidence	<input checked="" type="checkbox"/>	Medium Confidence	<input type="checkbox"/>	Low Confidence	<input type="checkbox"/>				

14. What is the pest’s potential as a vector of plant pathogens?

Japananus hyalinus belongs to the subfamily Deltocephalinae, tribe Scaphytopiini, other members of which are recorded as virus and phytoplasma vectors. This leafhopper is not recorded as a vector, but no specific studies have ever been done on its vectoring capabilities.

15. What is the area endangered by the pest?

Though it may establish in the UK, the pest is not expected to cause damage, so there is no endangered area.

STAGE 3: PEST RISK MANAGEMENT

16. What are the risk management options for the UK/PRA area?

Exclusion is unlikely due to the increasing spread of *J. hyalinus* within Europe and its ability to move as concealed eggs on nursery stock. The cryptic nature of the pest and the widespread nature of its host’s means that if populations establish outdoors they may go unnoticed for many years, and eradication would be very unlikely to succeed in the wider environment. It may be achievable on small populations that establish on artificially dwarfed *Acer* under protection using methods such as appropriate chemical treatments or physical control methods.

17. Summary and conclusions of the rapid PRA.

This rapid PRA shows:

This leafhopper feeding on *Acer* spp. is thought to originate from Asia, and is now also present in North America, Australia and parts of Europe, and its range is still expanding. No impacts have been recorded in any part of its current range.

Risk of entry

Japananus hyalinus is likely to enter on planting material originating from Europe but unlikely to arrive by natural spread from the continent.

Risk of establishment

Likely to establish outdoors across much of the UK where its host are present, but unlikely to establish under protection.

Economic, environmental and social impact

In its current area of distribution *J. hyalinus* is not reported to cause any impacts, and impacts in the UK would be expected to be very small.

Endangered area

Though the pest may establish, there is no endangered area.

Risk management options

Exclusion and eradication from outdoor sites is unlikely to be possible, but eradication of small populations that may occur in nurseries might be achieved.

Key uncertainties and topics that would benefit from further investigation

Status of the pest in the UK is uncertain – small populations may already have established. Continued contact with groups monitoring leafhopper activity in the UK should clarify if *J. hyalinus* is now present. Its potential as a virus/phytoplasma vector could be investigated.

18. Is there a need for a detailed PRA or for more detailed analysis of particular sections of the PRA? If yes, select the PRA area (UK or EU) and the PRA scheme (UK or EPPO) to be used.

(For completion by the Plant Health Risk Group) ✓ (put a tick in the box)

No	<input checked="" type="checkbox"/>
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Yes	<input type="checkbox"/>	PRA area: UK or EU	<input type="checkbox"/>	PRA scheme: UK or EPPO	<input type="checkbox"/>
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19. IMAGES OF THE PEST



Adult *Japananus hyalinus*. Image credit: Hemipterans of North Carolina/ Paul Scharf

20. Given the information assembled within the time scale required, is statutory action considered appropriate / justified?

[For completion by the Plant Health Risk Group] (put a tick in the box)

Yes

Statutory action

No

Statutory action

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