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Pest categorisation of Little cherry pathogen (non-EU isolates)

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Abstract

The EFSA Panel on Plant Health performed a pest categorisation of non-EU isolates of the Little cherry pathogen (LCP) for the European Union (EU) territory. LCP is now known to be in fact two distinct, well characterised viruses, *Little cherry virus 1* (LChV1) and *Little cherry virus 2* (LChV2) collectively referred to here as LChV. Efficient molecular detection assays are available for both viruses but not to discriminate EU and non-EU isolates. LChV are transmitted by vegetative multiplication of infected hosts and, for LChV2, by mealybug vectors. LChV are reported from a range of countries, both outside and within the EU. Non-EU isolates are not known to occur in the EU and therefore do not meet one of the criteria for being a Union regulated non-quarantine pest. The host ranges of LChV are restricted to *Prunus* species, in particular cultivated and ornamental cherries. LChV non-EU isolates are listed for some, but not all hosts, in Annex IIAI of Directive 2000/29/EC. LChV isolates are expected to be able to enter and establish in the EU. They have the potential to subsequently spread through plants for planting and, for LChV2, through the action of the *Phenacoccus aceris* vector, which is present in many EU MS. LChV are able to cause severe symptoms in some cherry varieties while others are less affected. Overall, non-EU LChV isolates meet all the criteria evaluated by EFSA to qualify as Union quarantine pests. However, given the currently limited impact of EU LChV isolates, the impact of non-EU isolates, if introduced, could be similarly limited. The main knowledge gaps and uncertainties concern (1) whether EU and non-EU isolates of LChV might differ in their biology, epidemiology or symptomatology, (2) efficiency of natural spread by vectors under EU conditions and (3) extent of symptoms caused on many EU-grown varieties.

Keywords: Little cherry disease, Little cherry virus, Closteroviridae, cherry, mealybug, vector

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1. Introduction

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

1.1.1. Background

Council Directive 2000/29/EC[1] on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community establishes the present European Union plant health regime. The Directive lays down the phytosanitary provisions and the control checks to be carried out at the place of origin on plants and plant products destined for the Union or to be moved within the Union. In the Directive's 2000/29/EC annexes, the list of harmful organisms (pests) whose introduction into or spread within the Union is prohibited, is detailed together with specific requirements for import or internal movement.

Following the evaluation of the plant health regime, the new basic plant health law, Regulation (EU) 2016/2031[2] on protective measures against pests of plants, was adopted on 26 October 2016 and will apply from 14 December 2019 onwards, repealing Directive 2000/29/EC. In line with the principles of the above mentioned legislation and the follow-up work of the secondary legislation for the listing of EU regulated pests, EFSA is requested to provide pest categorizations of the harmful organisms included in the annexes of Directive 2000/29/EC, in the cases where recent pest risk assessment/pest categorisation is not available.

1.1.2. Terms of reference

EFSA is requested, pursuant to Article 22(5.b) and Article 29(1) of Regulation (EC) No 178/2002,[3] to provide scientific opinion in the field of plant health.

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

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

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

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

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

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

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

1.1.2.1. Terms of Reference: Appendix 1

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

Annex IIAI

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

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

(b) Bacteria

Citrus variegated chlorosis
Erwinia stewartii (Smith) Dye
Xanthomonas campestris pv. *oryzae* (Ishiyama) Dye and pv. *oryzicola* (Fang. et al.) Dye

(c) Fungi

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

(d) Virus and virus-like organisms

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

Annex IIB

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

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

(b) Bacteria

Curtobacterium flaccumfaciens pv. flaccumfaciens (Hedges) Collins and Jones

(c) Fungi

Glomerella gossypii Edgerton
Gremmeniella abietina (Lag.) Morelet
Hypoxylon mammatum (Wahl.) J. Miller

1.1.2.2. Terms of Reference: Appendix 2

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

Annex IAI

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

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

1) *Carneocephala fulgida* Nottingham
2) *Draeculacephala minerva* Ball
3) *Graphocephala atropunctata* (Signoret)

Group of Tephritidae (non-EU) such as:

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

(c) Viruses and virus-like organisms

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

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

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

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

Annex IIAI

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

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

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

1.1.2.3. Terms of Reference: Appendix 3

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

Annex IAI

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

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

(b) Fungi

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

(c) Viruses and virus-like organisms

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

(d) Parasitic plants

Arceuthobium spp. (non-EU)

Annex IAII

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

Meloidogyne fallax Karssen
Popillia japonica Newman
Rhizoecus hibisci Kawai and Takagi

(b) Bacteria

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

(c) Fungi

Melampsora medusae Thümen
Synchytrium endobioticum (Schilbersky) Percival

Annex I B

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

Leptinotarsa decemlineata Say
Liriomyza bryoniae (Kaltenbach)

(b) Viruses and virus-like organisms

Beet necrotic yellow vein virus

1.2. Interpretation of the Terms of Reference

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

This pest categorisation covers non-EU isolates of the 'Little cherry pathogen', which is now known to be in fact two distinct viruses, *Little cherry virus 1* (LChV1) and *Little cherry virus 2* (LChV2). Non-EU isolates are defined by their geographical origin outside of the European Union. As such, a plant infected with LChV1 or LChV2 and originating from a non-EU country is considered infected with a non-EU 'Little cherry pathogen' isolate. EU 'Little cherry pathogen' isolates are not covered by the present pest categorisation, unless necessitated for a better understanding. In this case, the extension of coverage to EU isolates is explicitly indicated in the text.

2. Data and methodologies

2.1. Data

2.1.1. Literature search

A literature search on Little cherry pathogen (non-EU isolates) was conducted at the beginning of the categorisation. Further references and information were obtained from citations within the references and from the grey literature.

2.1.2. Database search

Pest information, on host(s) and distribution, was retrieved from the EPPO Global Database (EPPO, 2017).

Data about 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.

The Europhyt database was consulted for pest-specific notifications on interceptions and outbreaks. Europhyt is a web-based network launched by the Directorate General for Health and Consumers (DG SANCO), and is a subproject of PHYSAN (Phyto-Sanitary Controls) specifically concerned with plant health information. The Europhyt database manages notifications of interceptions of plants or plant products that do not comply with EU legislation, as well as notifications of plant pests detected in the territory of the MSs and the phytosanitary measures taken to eradicate or avoid their spread.

2.2. Methodologies

The Panel performed the pest categorisation for Little cherry pathogen (non-EU isolates), following guiding principles and steps presented in the EFSA guidance on the harmonised framework for pest risk assessment (EFSA PLH Panel, 2010) and as defined in the International Standard for Phytosanitary Measures No 11 (FAO, 2013) and No 21 (FAO, 2004).

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

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

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

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

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

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

The Panel will not indicate in its conclusions of the pest categorisation whether to continue the risk assessment process, but, following the agreed two-step approach, will continue only if requested by the risk managers. However, during the categorisation process, experts may identify key elements and knowledge gaps that could contribute significant uncertainty to a future assessment of risk. It would be useful to identify and highlight such gaps so that potential future requests can specifically target the major elements of uncertainty, perhaps suggesting specific scenarios to examine.

3. Pest categorisation

3.1. Identity and biology of the pest

3.1.1. Identity and taxonomy

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

YES

Little cherry disease is a disorder affecting sour and sweet cherry trees that has been known since the 1930's (Foster and Lott, 1947; Jelkmann and Eastwell, 2011). The graft transmissible agent responsible ('Little cherry pathogen') was previously considered to be a single virus species but studies have shown that two viruses belonging to the Closteroviridae family, *Little cherry virus 1* (LChV1, Jelkmann, 1995) and *Little cherry virus 2* (LChV2, Eastwell and Bernardy, 2001; Rott and Jelkmann, 2001, 2005) are associated with the disease. LChV1 is a member of the *Velarivirus* genus, while LChV2 belongs to the *Ampelovirus* genus (Martelli et al., 2012a,b; Martelli and Candresse, 2014). For the sake of simplicity, when collectively referred to, LChV1 and LChV2 will be designated in what follows as Little cherry viruses or LChV.

3.1.2. Biology of the pest

There is no indication that non-EU LChV isolates may differ in their biology from EU isolates (Jelkmann and Eastwell, 2011). What follows is therefore a description that similarly applies to EU and non-EU isolates. As is generally the case for plant viruses, LChV1 and LChV2 are able to systemically invade their infected hosts and are therefore transmitted to progeny plants produced through vegetative propagation practices (Jelkmann and Eastwell, 2011). They are not known to be pollen- or seed-transmitted (Jelkmann and Eastwell, 2011).

There are no known vectors for LChV1 (Jelkmann and Eastwell, 2011). LChV2 is known to be transmitted by the apple mealybug (*Phenacoccus aceris,* Signoret) (Raine et al., 1986) and by the grape mealybug (*Pseudococcus maritimus*, Ehrhorn) (Mekuria et al., 2013). In North American orchards, *Phenacoccus aceris* appears to be the main vector species (Raine et al., 1986). The ability of German populations of *Phenacoccus aceris* to transmit LChV2 has been experimentally demonstrated (Petruschke et al., 2011).

3.1.3. Intraspecific diversity

There are no indications that non-EU LChV isolates might show a broader molecular or biological diversity or might present original molecular or biological properties as compared to EU ones (Jelkmann and Eastwell, 2011). The intraspecific diversity of LChV is therefore addressed here considering both EU and non-EU isolates.

As for many other Closteroviridae members, the intraspecific molecular diversity LChV1 is high, with up to 20–25% nucleotide divergence between isolates at the whole genome level (the current species molecular discrimination criteria are an amino acid sequence divergence of more than 25% in relevant gene products (polymerase, CP, HSP70h) (Martelli et al., 2012a)). There is so far no evidence that LChV1 genetic diversity is structured by either host or geographic origin (Katsiani et al., 2015).

Fewer complete or partial sequences are available for LChV2, which adds more uncertainty to the description of its intraspecific variability. It however appears to be important, reaching up to 10–15% nucleotide divergence when comparing the few partial sequences available in Genbank. There is currently no clear information as to whether this variability might be associated with the geographic origin of the isolates or with their biological properties.

3.1.4. Detection and identification of the pest

Are detection and identification methods available for the pest?

YES

LChV1 and LChV2 can be detected through biological indexing by grafting of susceptible cherry indicator varieties such as Sam or Canindex (Hansen and Green, 1985; Jelkmann and Eastwell, 2011). Today the preferred detection techniques involve reverse-transcriptase polymerase chain reaction (RT-PCR) assays (Rybak et al., 2004; Jelkmann et al., 2008; Matic et al., 2010).

On the other hand, since no biological or molecular feature separating EU and non-EU isolates are currently known, no assays allowing the discrimination of non-EU isolates from EU ones is available.

3.2. Pest distribution

3.2.1. Pest distribution outside the EU

Given the asymptomatic infections in some hosts and the poorly symptomatic infection in other hosts (Jelkmann and Eastwell, 2011), it is likely that the presence of LChV1 and LChV2 has been significantly underreported. As a consequence, the actual geographic distribution of these viruses may actually be broader than currently known and could potentially include all or most areas where sweet, sour or flowering cherry species are grown (the later showing only asymptomatic infections) (Jelkmann and Eastwell, 2011) (Tables 2 and 3, Figures 1 and 2).

Table 2: Global distribution of *Little cherry virus 1* non EU isolates (extracted from EPPO Global Database, accessed March 8 2017) and complemented using recent references in the scientific literature

Continent	Country	Status	References
America	Canada	Present, restricted distribution	
America	United States of America	Present, restricted distribution	
Asia	China	Present, few occurrences	
Asia	Japan	Present, no details	
Asia	South Korea	Present	Cheong et al. (2015), Lim et al. (2015)
Asia	India	Present	Nagar et al. (2009)
Oceania	Australia	Absent, unreliable record	
Oceania	New Zealand	Present, restricted distribution	
Europe	Turkey	Present	Serce et al. (2011)
Europe	Moldova	Absent, unreliable record	

Last updated: 15/6/2017

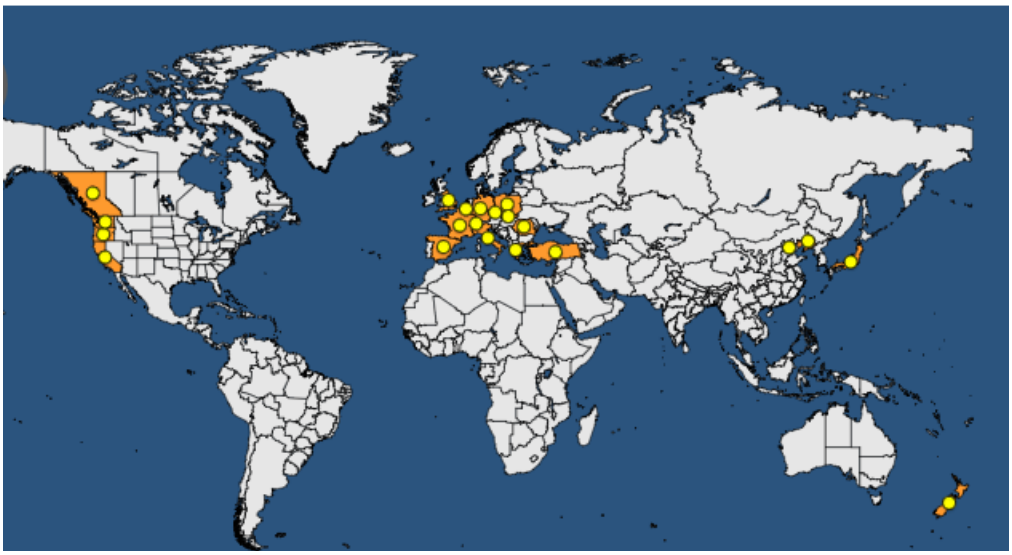

Figure 1: Global distribution of *Little cherry virus 1* (extracted from EPPO Global Database, accessed 22 June 2017)

Table 3: Global distribution of *Little cherry virus 2* non EU isolates (extracted from EPPO Global Database, accessed March 8 2017) and complemented using recent references in the scientific literature

Continent	Country	Status	References
America	Canada	Present, restricted distribution	
America	United States of America	Present, restricted distribution	
Asia	China	Present, restricted distribution	
Asia	Japan	Present, no details	
Asia	Korea, Republic	Present, no details	
Oceania	Australia	Present, few occurrences	
Oceania	New Zealand	Present, no details	
Europe	Switzerland	Present	Rott and Jelkmann (2001)

Last updated: 14/12/2016

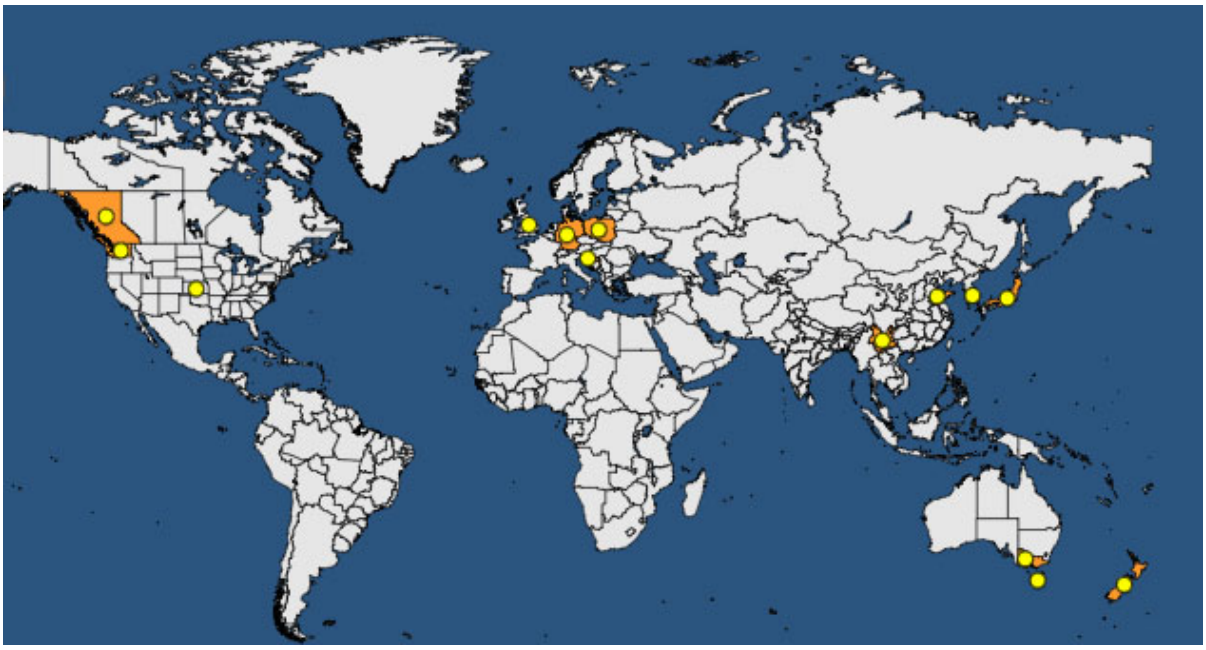

Figure 2: Global distribution of *Little cherry virus 2* (extracted from EPPO Global Database, accessed June 22 2017)

3.2.2. Pest distribution in the EU

Is the pest present in the EU territory?
NO

Given that non-EU isolates are defined by their geographic origin outside the EU, any non-EU isolates present in the EU would have to be associated with outbreaks clearly linked with the entry of the virus of viruliferous vectors, or with the introduction of infected plants originating from outside the EU.

Although both LChV1 and LChV2 are known to occur in a number of MS (and are likely to be under-reported), there is no evidence to link the LChV populations currently present in the EU with introductions from outside of the EU. There is therefore no evidence for the presence of non-EU isolates in the EU.

Since non-EU LChV1 and LChV2 isolates are not known to occur in the EU, they do not meet one of the criteria to qualify as a Union RNQP. What follows is a description of the currently available information on the distribution of EU LChV isolates.

Table 4: Current distribution of *Little cherry virus 1* and 2 (EU isolates) in the 28 EU MS based on information from the EPPO Global Database and other sources if relevant

Country	*Little cherry virus 1*	*Little cherry virus 2*	Other sources
Austria			
Belgium	Present, no details (1992)		
Bulgaria			
Croatia		Present, few occurrences (2014)	
Cyprus			

Country	*Little cherry virus 1*	*Little cherry virus 2*	Other sources
Czech Republic	Present, no details (2011)		EPPO Reporting Service (2012/038): Little cherry disease was observed in sweet and sour cherry orchards in the East Bohemia region (the identity of the virus LChV-1 or LChV-2 was not given) Šafářová et al. (2017) (First report of *Little cherry virus 1* infecting apricot in the Czech Republic)
Denmark			
Estonia			
Finland			
France	Absent, unreliable record (1993)		Marais et al. (2016) (First report of *Little cherry virus 1* on plum in France)
Germany	Present, restricted distribution (2010)	Present, no details (2012)	
Greece	Present, restricted distribution (2008)		
Hungary	Absent, unreliable record (1992)		
Ireland			
Italy	Present, restricted distribution (1993)		
Latvia			
Lithuania			
Luxembourg			
Malta			
Poland	Present, few occurrences (2006)	Present, few occurrences (2006)	
Portugal			
Romania	Present, no details (1992)		
Slovak Republic	Present, restricted distribution (2015)		
Slovenia			
Spain	Absent, pest no longer present (2011)		Ruiz-Garcia et al. (2016) (First Report of *Little cherry virus 1* (LChV-1) in sweet cherry in Spain)
Sweden	Absent, intercepted only (1993)		
Netherlands	Absent, intercepted only (1993)		
United Kingdom	Present, few occurrences (1994)	Present, no details (2012)	

3.3. Regulatory status

3.3.1. Council Directive 2000/29/EC

Little cherry pathogen (non-EU isolates) is listed in Council Directive 2000/29/EC. Details are presented in Tables 5 and 6.

Table 5: Little cherry pathogen (non-EU isolates) in Council Directive 2000/29/EC

Annex II, Part A	**Harmful organisms whose introduction into, and spread within, all Member States shall be banned if they are present on certain plants or plant products**	
Section I	**Harmful organisms not known to occur in the community and relevant for the entire community**	
(d)	Virus and virus-like organisms	
	Species	Subject of contamination
9.	Little cherry pathogen (non- European isolates	Plants of *Prunus cerasus* L., *Prunus avium* L., *Prunus incisa* Thunb., *Prunus sargentii* Rehd., *Prunus serrula* Franch., *Prunus serrulata* Lindl., *Prunus speciosa* (Koidz.) Ingram, *Prunus subhirtella* Miq., *Prunus yedoensis* Matsum., and hybrids and cultivars thereof, intended for planting, other than seeds

3.3.2. Legislation addressing plants and plant parts on which on which Little cherry pathogen (non- EU isolates) is regulated

Table 6: Regulated hosts and commodities that may involve Little cherry Pathogen (non-EU isolates) in Annexes III, IV and V of Council Directive 2000/29/EC

Annex III, Part A	**Plants, plant products and other objects the introduction of which shall be prohibited in all member states**
Description	Country of origin
9. Plants of *Chaenomeles* Ldl., *Cydonia* Mill., *Crataegus* L., *Malus* Mill., *Prunus* L., *Pyrus* L., and *Rosa* L., intended for planting, other than dormant plants free from leaves, flowers and fruit	Non-European countries
18. Plants of *Cydonia* Mill., *Malus* Mill., *Prunus* L. and *Pyrus* L. and their hybrids, and *Fragaria* L., intended for planting, other than seeds	Without prejudice to the prohibitions applicable to the plants listed in Annex III A (9), where appropriate, non-European countries, other than Mediterranean countries, Australia, New Zealand, Canada, the continental states of the USA
Annex IV, Part A	**Special requirements which must be laid down by all member states for the introduction and movement of plants, plant products and other objects into and within all member states**
Section I	Plants, plant products and other objects originating outside the community
Plants, plant products and other objects	Special requirements
23.2 Plants of *Prunus* L., intended for planting (a) originating in countries where the relevant harmful organisms are known to occur on *Prunus* L. (b) other than seeds, originating in countries where the relevant harmful organisms are known to occur (c) other than seeds, originating in non-European countries where the relevant harmful organisms are known to occur The relevant harmful organisms are: – or the case under (c): – Little cherry pathogen	Without prejudice to the provisions applicable to the plants, where appropriate listed in Annex III(A)(9) and (18) or Annex IV(A)(I)(15), (19.2) and (23.1), official statement that (a) the plants have been: – either officially certified under a certification scheme requiring them to be derived in direct line from material which has been maintained under appropriate conditions and subjected to official testing for at least the relevant harmful organisms using appropriate indicators or equivalent methods and has been found free, in these tests, from those harmful organisms, or derived in direct line from material which is maintained under appropriate conditions and has been subjected, within the last three complete cycles of vegetation, at least once, to official testing for at least the relevant harmful organisms using appropriate indicators or equivalent methods and has been found free, in these tests, from those harmful organisms, (b) no symptoms of diseases caused by the relevant harmful organisms have been observed on plants at the place of production or on susceptible plants in its immediate vicinity, since the beginning of the last three complete cycles of vegetation

Annex V,	**Plants, plant products and other objects which must be subject to a plant health inspection (at the place of production if originating in the community, before being moved within the community — in the country of origin or the consignor country, if originating outside the community) before being permitted to enter the community**
Part A	Plants, plant products and other objects originating outside the community
	1.1. Plants, intended for planting, other than seeds, of *Amelanchier* Med., *Chaenomeles* Lindl., *Cotoneaster* Ehrh., *Crataegus* L., *Cydonia* Mill., *Eriobotrya* Lindl., *Malus* Mill., *Mespilus* L., *Photinia davidiana* (Dcne.) Cardot, *Prunus* L., other than *Prunus laurocerasus* L. and *Prunus lusitanica* L., *Pyracantha* Roem., *Pyrus* L. and *Sorbus* L. 2.1. Plants intended for planting, other than seeds, of the genera *Abies* Mill., *Apium graveolens* L., *Argyranthemum* spp., *Asparagus officinalis* L., *Aster* spp., *Brassica* spp., *Castanea* Mill., *Cucumis* spp., *Dendranthema* (DC.) Des Moul., *Dianthus* L. and hybrids, *Exacum* spp., *Fragaria* L., *Gerbera* Cass., *Gypsophila* L., all varieties of New Guinea hybrids of *Impatiens* L., *Lactuca* spp., *Larix* Mill., *Leucanthemum* L., *Lupinus* L., *Pelargonium* l'Hérit. ex Ait., *Picea* A. Dietr., *Pinus* L., *Platanus* L., *Populus* L., *Prunus laurocerasus* L., *Prunus lusitanica* L., *Pseudotsuga* Carr., *Quercus* L., *Rubus* L., *Spinacia* L., *Tanacetum* L., *Tsuga* Carr., Verbena L. and other plants of herbaceous species, other than plants of the family Gramineae, intended for planting, and other than bulbs, corms, rhizomes, seeds and tubers
Part B	**Plants, plant products and other objects originating in territories, other than those territories referred to in part A** **I. Plants, plant products and other objects which are potential carriers of harmful organisms of relevance for the entire Community**
	1. Plants, intended for planting, other than seeds but including seeds of Cruciferae, Gramineae, *Trifolium* spp., originating in Argentina, Australia, Bolivia, Chile, New Zealand and Uruguay, genera Triticum, Secale and *X Triticosecale* from Afghanistan, India, Iran, Iraq, Mexico, Nepal, Pakistan, South Africa and the USA, *Citrus* L., *Fortunella* Swingle and *Poncirus* Raf., and their hybrids, *Capsicum* spp., *Helianthus annuus* L., *Solanum lycopersicum* L., *Medicago sativa* L., *Prunus* L., *Rubus* L., *Oryza* spp., *Zea mays* L., *Allium ascalonicum* L., *Allium cepa* L., *Allium porrum* L., *Allium schoenoprasum* L. and *Phaseolus* L. 2. Parts of plants, other than fruits and seeds, of: —*Prunus* L., originating in non-European countries, 3. Fruits of: *Citrus* L., *Fortunella* Swingle, *Poncirus* Raf., and their hybrids, *Momordica* L. and *Solanum melongena* L. *Annona* L., *Cydonia* Mill., *Diospyros* L., *Malus* Mill., *Mangifera* L., *Passiflora* L., *Prunus* L., *Psidium* L., *Pyrus* L., *Ribes* L. *Syzygium* Gaertn. and *Vaccinium* L., originating in non-European countries

3.3.3. Legislation addressing the organisms vectored by Little cherry pathogen (non- EU isolates) (Directive 2000/29/EC)

Identified vectors include *Phenacoccus aceris* and *Pseudococcus maritimus*, which are not covered by specific legislation in 2000/29/EC.

3.4. Entry, establishment and spread in the EU

3.4.1. Host range

There are no indications that the host range of non-EU LChV isolates might differ from that of EU isolates (Jelkmann and Eastwell, 2011). What follows is therefore a presentation on the host range of LChV, irrespective of their EU or non-EU status. Natural host ranges of LChV1 and LChV2 are so far limited to species within the *Prunus* genus (Jelkmann and Eastwell, 2011). *Nicotiana occidentalis* has been identified as an experimental host of LChV1 following experimental transmission using dodder (*Cuscuta europea*) (Jelkmann et al., 2010).

An important part of the information on the host range of LChV1 and LChV2 was gathered using biological indexing, at a time when the existence of these two different viruses was not known. It is therefore not possible to know, in retrospect, whether these original host range reports concern LChV1, LChV2 or possibly both of them. The ability of both viruses to infect sour, sweet and ornamental flowering cherry is however unambiguously demonstrated. Recent reports unambiguously establish the ability of at least some LChV1 isolates to infect peach, domestic plum, Japanese plum, apricot and almond.

Table 7: *Little cherry virus 1* host range as obtained from the EPPO Global Database interrogated on March 8, 2017 and supplemented by information obtained in the scientific literature

Organism	Source of information if different from the EPPO Global Database
Cultivated cherry hosts of LChV1 and LChV2	
Prunus avium	
Prunus cerasus	
Ornamental and wild species, hosts of LChV1 and/or of LChV2	
Prunus emarginata	
Prunus incisa	
Prunus mahaleb	
Prunus pensylvanica	
Prunus sargentii	
Prunus serrula	
Prunus serrulata	
Prunus subhirtella	
Prunus tomentosa	
Prunus x sieboldii	
Prunus x yedoensis	
Prunus emarginata	
Prunus incisa	
Prunus fontanesiana	Jelkmann and Eastwell (2011)
Prunus maaki	Jelkmann and Eastwell (2011)
Cultivated species hosts of LChV1	
Prunus persica	Lim et al. (2015), Matic et al. (2007)
Prunus amygdalus	Matic et al. (2007)
Prunus domestica	Marais et al. (2016), Matic et al. (2007)
Prunus salicina	Matic et al. (2009)
Prunus armeniaca	Šafářová et al. (2017)

LChV are regulated in most of their known hosts (see Section 3.3.1). However, some hosts are not regulated, such as *Prunus mahaleb* (sometimes used as a rootstock) or the recently described hosts of LChV1 such as peach, almond, apricot, domestic and Japanese plum.

3.4.2. Entry

Is the pest able to enter into the EU territory?

YES

The main pathway for entry is the trade of plants for planting of susceptible *Prunus* species. The current legislation addressing plants for planting for *Prunus* sp. allows the importation from Mediterranean countries, Australia, New Zealand, Canada and the continental states of the USA of dormant plants for planting that are 'free from leaves, flowers and fruit' (see Section 3.3.1). The restriction of trade to dormant plants does not affect a systemic pathogen like LChV and in some of these countries; LChV is known to be present. Other measures are either pathogen specific (Annex IV) or rely on plant health inspection (Annex V) and are therefore unlikely to provide an efficient protection against pathogens that are latent or poorly symptomatic under a range of situations, as is the case for LChV. Indeed, between 1995 and June 8, 2017 there is one record of interception of Little cherry pathogen in the Europhyt database (in 2014).

3.4.3. Establishment

3.4.3.1. EU distribution of main host plants

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

YES

Susceptible *Prunus* species, in particular sour and sweet cherry are widely grown in the EU and are able to develop in a wide range of EU ecoclimatic zones. Systemic viral pathogens like LChV are able to successfully infect their hosts wherever these are able to develop. Indeed, LChV EU isolates are already present in a range of EU MS (see Section 3.2.2 and Table 4) and are not known to differ in their host range or ecoclimatic requirements from non-EU isolates. It is therefore expected that non-EU LChV isolates would be able to successfully establish in a very large part of the EU territory, wherever conditions are suitable to grow cherry trees.

Table 8: Area of cherry cultivation/production for EU MS (in thousands of ha). Extracted from the Eurostat database on the 10th of May, 2017

GEO/TIME	2010	2011	2012	2013	2014	2015	2016	%*
Poland	45.10	45.50	45.30	38.00	38.60	39.10	na	na
Italy	29.25	29.39	28.97	29.73	28.97	29.25	29.11	21.96
Spain	24.28	24.97	24.95	25.36	25.59	26.49	26.95	20.34
Hungary	15.95	15.66	15.56	16.38	16.06	15.64	15.64	11.80
Greece	9.88	9.92	10.53	11.88	13.59	14.46	14.38	10.85
Bulgaria	9.20	9.40	8.46	9.05	7.21	9.26	8.43	6.36
France	9.46	9.00	8.59	8.26	8.22	8.15	8.18	6.17
Germany	8.30	8.19	7.46	7.42	7.36	7.21	7.14	5.39
Portugal	5.65	5.66	5.79	6.10	6.12	6.37	6.37	4.81
Romania	6.93	6.85	6.83	7.08	6.45	6.31	6.10	4.60
Croatia	4.07	3.82	3.35	3.20	3.55	3.11	3.39	2.56
Czech Republic	2.75	2.62	2.69	2.54	2.45	2.28	2.19	1.65
Belgium	1.21	1.16	1.05	1.19	1.27	1.31	1.32	1.00
Denmark	1.53	1.52	1.42	1.33	1.22	1.14	1.04	0.78
Netherlands	0.80	0.71	0.74	0.73	0.79	0.84	0.82	0.62

GEO/TIME	2010	2011	2012	2013	2014	2015	2016	%*
Lithuania	0.77	0.78	0.81	0.81	0.83	0.78	0.77	0.58
Austria	0.26	0.27	0.27	0.26	0.24	0.23	0.24	0.18
Cyprus	0.25	0.24	0.22	0.23	0.20	0.22	0.21	0.16
Slovenia	0.13	0.14	0.15	0.16	0.17	0.17	0.18	0.14
Slovakia	0.33	0.00	0.00	0.25	0.20	0.19	0.17	0.13
Latvia	na	na	na	na	na	0.10	0.10	0.08
United Kingdom	0.50	0.00	0.00	1.00	1.00	0.70	na	na
Sweden	0.09	0.09	0.07	0.05	0.04	0.04	0.04	0.03
Malta	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Luxembourg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ireland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Finland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Estonia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
European Union (SUM)	**176.69**	**175.89**	**173.21**	**171.01**	**170.13**	**173.12**	**132.53**	**100**

na: not available.
*: Percentages of the EU production calculated for 2016 without taking into account the production of countries for which 2016 production data is not available.

3.4.4. Spread

3.4.4.1. Vectors and their distribution in the EU (if applicable)

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

YES

How? Through production and trade of plants for planting of susceptible *Prunus* species and for LChV2, through the action of its natural vector, *P. aceris*, which occurs in many EU MS (Figure 3).

As indicated in Section 3.1.2 LChV is a systemic viral pathogen and is therefore transmitted to progeny plants produced through vegetative propagation techniques (Jelkmann and Eastwell, 2011). This efficient mechanism provides for the long distance spread on LChV.

LChV2 is in addition transmitted on a local scale by its vector *Phenacoccus aceris*, the apple mealybug, a widespread European species. The efficiency of transmission of LChV2 by *P. aceris* or other vectors in Europe is not known but the limited prevalence of the virus could indicate low intrinsic transmission efficiency or low populations of the vector(s).

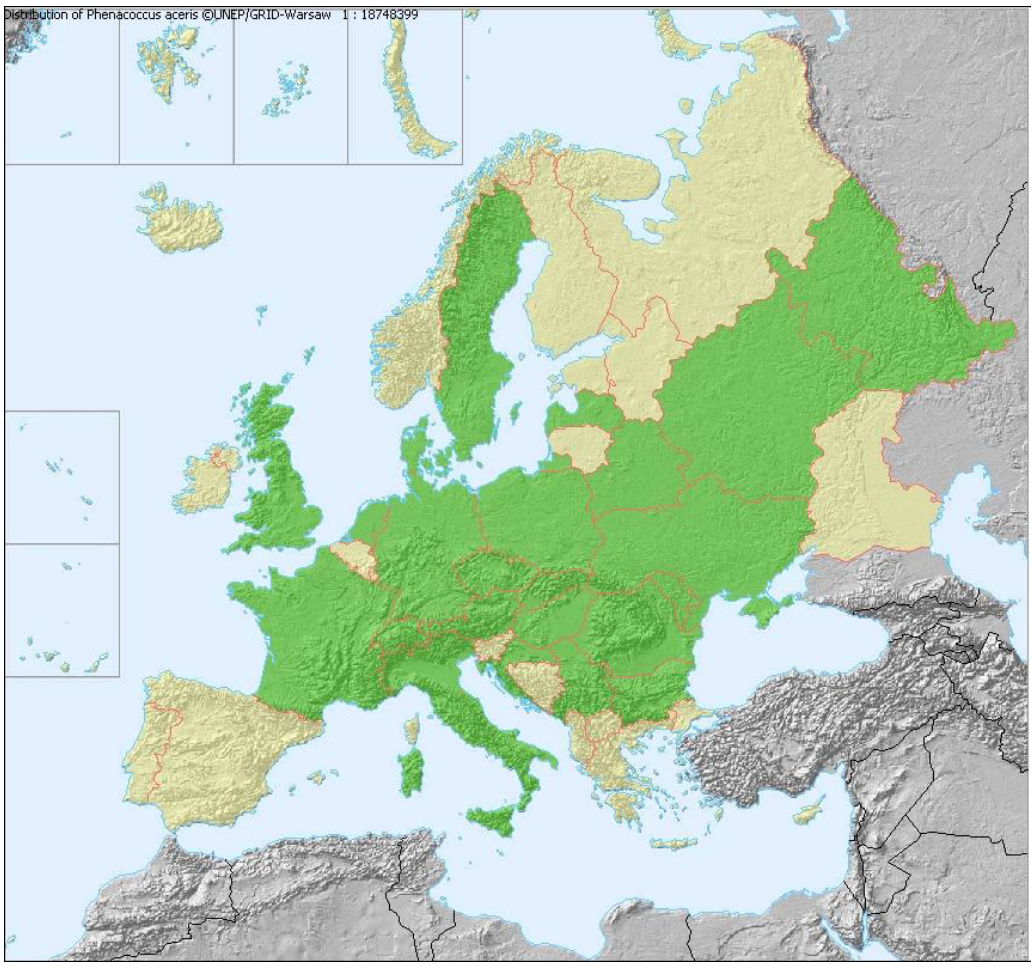

Figure 3: Distribution of *Phenacoccus aceris* extracted on the 11 May from Fauna Europaea (2017) www.faunaeur.org/Maps/ (de Jong et al., 2014)

3.5. Potential or observed impacts in the EU

Would the pests' introduction have an economic or environmental impact on the EU territory?
YES but likely limited.
Would the pests' introduction have an environmental impact on the EU territory?
NO

3.5.1. Potential pest impacts

3.5.1.1. Direct impacts of the pest

Distinct fruit symptoms occur in some cherry varieties (in particular in some North American dark-fruited cultivars), with an important reduction in fruit size and colour and a degradation of fruit taste. In such very susceptible cultivars, infection may result in complete or near complete loss of the harvest (Jelkmann and Eastwell, 2011). However, other cherry cultivars show less pronounced symptoms or may even be tolerant (Wood and McLaren, 1990; Jelkmann and Eastwell, 2011). In some varieties, fruit size and colour may almost be normal but taste remains severely affected. Besides the variety, the intensity of symptoms appears to be also affected by other parameters, including rootstock and

climate (Jelkmann and Eastwell, 2011). Mixed infections by LChV1 and LChV2 may also result in more severe symptoms.

Besides the impact on fruit, infection in a number of varieties cause premature leaf reddening, a symptom that is used for viral indexing on the very susceptible Canindex cultivar (Jelkmann and Eastwell, 2011). Some growth reduction may also be observed in some varieties.

A commercial impact of major magnitude has been historically documented in British Columbia in Canada, where production was drastically reduced in some areas (reduction of 90% over a 30 year period; reviewed in Jelkmann and Eastwell, 2011). More limited economic impact has also been reported in the western states of the USA (Uyemoto and Scott, 1992).

3.5.1.2. Indirect pest impacts (e.g. by bacteria or viruses transmitted by the pest)

The only identified indirect impacts are those associated with the control of the pest or of its vector(s).

3.5.2. Observed pest impacts in the EU

As indicated in Section 3.2.2, there is no indication that non-EU isolates are present in the EU and consequently no impact to report. However, EU isolates of LChV are present in a range of countries and there are no indications that non-EU isolates might differ in their biology, epidemiology or symptomatology from those already present. The impact of the EU isolates can thus provide an indication as to what might be the impact of non-EU isolates should they be introduced.

As far as is known or reported, impact of LChV in the EU has generally been limited if not minimal, without a clear indication as to whether this is linked to limited prevalence and spread or to a limited ability to cause severe symptoms in the most important EU grown cherry varieties. LChV has however been reported as a significant problem in the northern German 'Altes land' area (Büttner et al., 1993, 1994; Jelkmann and Eastwell, 2011).

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

YES for entry: tightening of regulations to include *Prunus* spp. hosts that are not covered by the current legislation.

3.6. Availability and limits of mitigation measures

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

- Asymptomatic or poorly symptomatic infection in some hosts (Jelkmann and Eastwell, 2011)
- Host range likely still not fully known as shown by the recent description of novel hosts
- LChV not currently regulated in some of its hosts (see Section 3.4.1)
- Systemic pathogen for which a restriction of trade to dormant plants for planting is not effective.
- No clear ecoclimatic limitations besides those applying to the host
- *Phenacoccus aceris* vector species widespread in the EU

3.6.2. Control methods

- Certification schemes for virus-free planting material of susceptible Prunus species, in particular cherry species (Jelkmann and Eastwell, 2011). This is by far the most efficient control method, because efficient diagnostics are available and because of the limited efficiency of vector-mediated spread.
- Removal of infected trees in eradication or containment programs (Jelkmann and Eastwell, 2011).
- Control of the insect vector(s) in orchards (Jelkmann and Eastwell, 2011).
- Use of cherry varieties selected for their lower susceptibility (Jelkmann and Eastwell, 2011).

3.7. Uncertainty

The Panel identified three mains sources of uncertainty in the present opinion:

- Limited information as to whether EU and non-EU isolates of LChV might differ in their biology, epidemiology or symptomatology
- Lack of information on the efficiency of the natural spread by vector(s) under EU conditions
- Limited information available on the extent of symptoms that could be caused on many EU-grown varieties

These uncertainties primarily affect two aspects of the present pest categorisation, the efficiency and extent to which non-EU isolates would be able to spread and the impact they would have on EU cherry production if introduced in the EU.

4. Conclusions

Little cherry pathogen (non-EU isolates) meets the criteria required to satisfy the definition of a Union quarantine pest. However, there are no indications that non-EU LChV isolates might show a broader molecular or biological diversity or might present original molecular or biological properties as compared to EU ones.

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	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Identity of the pest (Section 3.1)	Is the identity of the pest established? **YES**	Is the identity of the pest established? **YES**	Well characterised viruses, very limited uncertainty. But information lacking as to whether EU and non-EU isolates of LChV might differ in their biology, epidemiology or pathogenicity
Absence/presence of the pest in the EU territory (Section 3.2)	The pest is **not known to occur** in the EU territory	The pest is not known to occur in the EU territory, therefore does not qualify as a RNQP	Although not documented, some non-EU LChV isolates might be present in the EU
Regulatory status (Section 3.3)	LChV non-EU isolates currently regulated under Directive 2000/29 but not in some hosts	LChV non-EU isolates currently regulated under Directive 2000/29 but not in some hosts	No uncertainties
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? **YES**	Plants for planting constitute the main entry pathway and the main means of spread over long distances	Uncertainties limited for entry and establishment. Lack of knowledge on efficiency of vector-mediated transmission cause important uncertainties on the extent of spread that could occur upon introduction
Potential for consequences in the EU territory (Section 3.5)	LChV has the potential to cause significant impact (yield and quality losses) in at least some cherry cultivars. However, the currently limited impact of EU LChV isolates suggests that impact of non-EU isolates, if introduced, could similarly be limited	Because of the negative impact of LChV on cherry production, the presence of LChV on cherry plants for planting would have a negative impact on their intended use	Incomplete data on the extent of symptoms on many EU-grown varieties. Given the uncertainties affecting also the extent of expected spread, the evaluation of the expected impact is the part of this assessment affected by the most important uncertainties

Criterion of pest categorisation	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union quarantine pest	Panel's conclusions against criterion in Regulation (EU) 2016/2031 regarding Union regulated non-quarantine pest	Key uncertainties
Available measures (Section 3.6)	Tightening of regulations to include hosts that are not covered by the current legislation and to reduce the probability of entry on *Prunus* spp. materials lawfully being introduced (testing…) has the potential to further reduce the risk of introduction and spread Certification of planting material of susceptible Prunus species is by far the most efficient control method, because efficient diagnostics are available and because of the limited efficiency of vector mediated spread Removal of infected trees, control of the insect vector(s) in orchards and use of cherry varieties selected for their lower susceptibility can also be of interest to control spread and impact	Certification of planting material of susceptible Prunus species is by far the most efficient control method, because efficient diagnostics are available and because of the limited efficiency of vector mediated spread Removal of infected trees, control of the insect vector(s) in orchards and use of cherry varieties selected for their lower susceptibility can also be of interest to control spread and impact	Uncertainties on host range
Conclusion on pest categorisation (Section 4)	Non-EU LChV isolates meet all the criteria evaluated by EFSA to qualify as Union quarantine pests. However, given the currently limited impact of EU LChV isolates, the impact of non-EU isolates, if introduced, could similarly be limited	Non-EU LChV isolates does not meet the presence on the territory criterion and therefore does not qualify as a Union RNQP	
Aspects of assessment to focus on/scenarios to address in future if appropriate	The main knowledge gaps concern (1) information as to whether EU and non-EU isolates might differ in their biology, epidemiology or symptomatology, (2) efficiency of natural spread by vectors under EU conditions and (3) the limited information available on the extent of symptoms on many EU-grown varieties Given that the present categorisation has explored most if not all of the available data on these points, a more complete assessment is unlikely to provide much clearer conclusions		

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Abbreviations

EPPO	European and Mediterranean Plant Protection Organization
EU MS	European Union Member State
FAO	Food and Agriculture Organization
IPPC	international Plant Protection Convention
LChV1	*Little cherry virus 1*
LChV2	*Little cherry virus 2*
RA	risk assessment
PLH	Plant health
RNQP	Regulated non-quarantine pest
RT-PCR	reverse-transcriptase polymerase chain reaction
TFEU	Treaty on the Functioning of the European Union
ToR	Terms of Reference