SCIENTIFIC OPINION

EFSA Journal

ADOPTED: 31 December 2018

doi: 10.2903/j.efsa.2019.5501

List of non-EU viruses and viroids of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L.

EFSA Panel on Plant Health (PLH),
Claude Bragard, Katharina Dehnen-Schmutz, Paolo Gonthier, Marie-Agnès Jacques, Josep Anton Jaques Miret, Annemarie Fejer Justesen, Alan MacLeod, Christer Sven Magnusson, Panagiotis Milonas, Juan A Navas-Cortes, Stephen Parnell, Roel Potting, Philippe Lucien Reignault, Hans-Hermann Thulke, Wopke Van der Werf, Antonio Vicent Civera, Jonathan Yuen, Lucia Zappalà, Thierry Candresse, Elisavet Chatzivassiliou, Stephan Winter, Michela Chiumenti, Francesco Di Serio, Tomasz Kaluski, Angelantonio Minafra and Luisa Rubino

Abstract

The Panel on Plant Health performed a listing of non-EU viruses and viroids (reported hereinafter as viruses) of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. A systematic literature review identified 197 viruses infecting one or more of the host genera under consideration. Viruses were allocated into three categories (i) 86 non-EU viruses, known to occur only outside the EU or having only limited presence in the EU (i.e. reported in only one or few Member States (MSs), known to have restricted distribution, outbreaks), (ii) 97 viruses excluded at this stage from further categorisation efforts because they have significant presence in the EU (i.e. only reported so far from the EU or known to occur or be widespread in some MSs or frequently reported in the EU), (iii) 14 viruses with undetermined standing for which available information did not readily allow to allocate to one or the other of the two above groups. Comments provided by MSs during consultation phases were integrated in the opinion. The main knowledge gaps and uncertainties of this listing concern (i) the geographic distribution and prevalence of the viruses analysed, in particular when they were recently described; (ii) the taxonomy and biological status of a number of poorly characterised viruses; (iii) the host status of particular plant genera in relation to some viruses. The viruses considered as non-EU and those with undetermined standing will be categorised in the next steps to answer a specific mandate from the Commission to develop pest categorisations for non-EU viruses. This list does not imply a prejudice on future needs for a pest categorisation for other viruses which are excluded from the current categorisation efforts.

© 2019 European Food Safety Authority. *EFSA Journal* published by John Wiley and Sons Ltd on behalf of European Food Safety Authority.

Keywords: Virus, non-EU, European Union, pest risk, plant health, plant pest, quarantine

Requestor: European Commission

Question numbers: EFSA-Q-2018-00272, EFSA-Q-2018-00633, EFSA-Q-2018-00634, EFSA-Q-2018-00635, EFSA-Q-2018-00636, EFSA-Q-2018-00637, EFSA-Q-2018-00638, EFSA-Q-2018-00639

Correspondence: alpha@efsa.europa.eu

Panel members: Claude Bragard, Katharina Dehnen-Schmutz, Francesco Di Serio, Paolo Gonthier, Marie-Agnès Jacques, Josep Anton Jaques Miret, Anne Marie Fejer Justesen, Alan MacLeod, Christer Sven Magnusson, Panagiotis Milonas, Juan A Navas-Cortes, Stephen Parnell, Roel Potting, Philippe L Reignault, Hans-Hermann Thulke, Wopke Van der Werf, Antonio Vicent, Jonathan Yuen and Lucia Zappalà.

Competing interests: In line with EFSA's policy on declarations of interest, Panel member Francesco Di Serio did not participate in the adoption of this scientific output.

Acknowledgements: This Scientific Opinion was prepared in cooperation with the Istituto per la Protezione Sostenibile delle Piante, Consiglio Nazionale delle Ricerche (Italy) under the EFSA Art. 36 Framework Partnership Agreement "GP/EFSA/ALPHA/2017/02" – Lot 5 GA1 – Pest categorisation of large groups: viral and bacterial pathogens of fruit crops.

The Panel wishes to acknowledge all competent European institutions, Member State bodies and other organisations that provided data for this scientific output and participated in consultations.

Suggested citation: EFSA PLH Panel (EFSA Plant Health Panel), Bragard C, Dehnen-Schmutz K, Gonthier P, Jacques M-A, Jaques Miret JA, Justesen AF, MacLeod A, Magnusson CS, Milonas P, Navas-Cortes JA, Parnell S, Potting R, Reignault PL, Thulke H-H, Van der Werf W, Vicent Civera A, Yuen J, Zappalà L, Candresse T, Chatzivassiliou E, Winter S, Chiumenti M, Di Serio F, Kaluski T, Minafra A and Rubino L, 2019. Scientific Opinion on the list of non-EU viruses and viroids of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. EFSA Journal 2019;17(9):5501, 46 pp. https://doi.org/10.2903/j.efsa.2019.5501

ISSN: 1831-4732

© 2019 European Food Safety Authority. *EFSA Journal* published by John Wiley and Sons Ltd 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.

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

Table of contents

Abstract 1
1. Introduction 4
1.1. Background and Terms of Reference as provided by the requestor 4
1.1.1. Background 4
1.1.2. Terms of Reference 4
1.1.2.1. Terms of Reference: Appendix 1 5
1.1.2.2. Terms of Reference: Appendix 2 6
1.1.2.3. Terms of Reference: Appendix 3 7
1.2. Interpretation of the Terms of Reference 8
2. Data and methodologies 8
2.1. Data 8
2.1.1. Literature search 8
2.1.2. Database search 9
2.2. Methodologies 9
3. Listing of non-EU viruses and viroids 10
3.1. Viruses considered as non-EU 10
3.2. Viruses excluded from further categorisation in the frame of the present mandate 10
3.3. Viruses with undetermined standing 11
4. Uncertainty 11
5. Conclusions 11
References 11
Abbreviations 19
Appendix A – Viruses and viroids of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. considered as non-EU. 20
Appendix B – Viruses and viroids of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. excluded from further categorisation. 31
Appendix C – Viruses and viroids of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. with undetermined standing 43
Annex A – List of viruses considered in the opinion 46

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 end 2019. The pests included in Appendix 3 cover pests of Annex I part A section I and all pests categorisations should be delivered by end 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)
Gonipterus scutellatus Gyll.
Ips amitinus Eichhof
Ips cembrae Heer
Ips duplicatus Sahlberg
Ips sexdentatus Börner
Ips typographus Heer
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

This scientific opinion presents the list of non-EU viruses and viroids of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L., for which the Panel will conduct the pest categorisation. This list is based on information collected from databases up to 19 March 2018.

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. are pests listed in the Appendices to the Terms of Reference (ToR) to be subject to pest categorisation to determine whether they fulfil the criteria of quarantine pests or those of regulated non-quarantine pests for the area of the 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.

According to the ToR, EFSA is asked to develop pest categorisations for the non-EU viruses and viroids of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L., the group of plants herein called host plants. As a first step towards this goal, the Panel made a list of non-EU viruses and viroids (viruses and viroids, although different biological categories, are summarised together as 'viruses' in the rest of this opinion) infecting the host plants. In the process, three groups of viruses were distinguished: non-EU viruses, viruses with significant presence in the EU (known to occur in several MSs, frequently reported in the EU, widespread in several MSs) or so far reported only from the EU, and viruses with undetermined standing for which available information did not readily allow to allocate to one or the other of the two above groups. A non-EU virus is defined by its geographical origin outside of the EU territory. As such, viruses not reported from the EU and occurring only outside of the EU territory are considered as non-EU viruses. Likewise, viruses occurring outside the EU and having only a limited presence in the EU (reported in only one or few MSs, with restricted distribution, outbreaks) are also considered as non-EU.

This opinion provides the methodology and results for this classification which precedes but does not prejudice the actual pest categorisation linked with the present mandate. This means that the Panel will then perform pest categorisations for the non-EU viruses and for those with undetermined standing. The viruses with significant presence in the EU or so far reported only from the EU will be also listed, but they will be excluded from the current categorisation efforts. The Commission at any time may present a request to EFSA to categorise some or all the viruses excluded from the current EFSA categorisation.

In this opinion, to capture the broadest possible range of viruses, poorly characterised ones for which very partial molecular or biological data is available were also considered.

Virus-like diseases of unknown aetiology or diseases caused by phytoplasmas and other graft-transmissible bacteria are not addressed in this opinion.

2. Data and methodologies

2.1. Data

2.1.1. Literature search

The literature considered to generate the list of viruses infecting *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L., and to fill in the extraction table on their distribution was obtained from authoritative books/compendia (Hadidi et al., 2011, 2017a,b; Meng et al., 2017), reviews (Martin and Tzanetakis, 2006; Martin et al., 2013; Martelli, 2014; Rubio et al., 2017), expert knowledge and extensive literature searches performed in the ISI Web of Science

bibliographic database (last access 19th of March 2018). For each plant genus, searches in ISI Web of Science were performed using as key words virus/viroid combined with the scientific name of the genus OR the common name(s) of the crops. Therefore, for each plant genus, searches in ISI Web of Science were performed according to the following strategy:

TS=((virus* OR viroid*) AND (latin name of the host genus - i.e. *Vitis* - OR common name in English of the crop - i.e. grapevine -)

When the number of gathered references was lower than 1,000 (i.e. in the case of *Cydonia* Mill. and *Ribes* L.), all the references were screened by title and, if needed, by abstract with the specific objective of selecting those providing additional information regarding distribution and host range of viruses included in the list or novel viruses not included yet. When the number of gathered references was higher than 1,000 (i.e. in the case of *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Rubus* L. and *Vitis* L.) the search was restricted to cover the period from 2010 to 2018, as earlier references were felt sufficiently covered by the other sources and reference books. In addition, references gathered without any time limitation were further filtered using the following strings:

TS = (Next generation sequencing OR NGS OR highthroughput sequencing OR high-throughput sequencing OR HTS)

and

TS = (first report OR disease note OR new host OR novel virus OR new virus)

which allow looking for novel viruses identified by high-throughput sequencing (HTS) and expanding information on distribution by screening first reports of viruses/crop combinations in certain countries, respectively.

Extensive literature searches by using as keyword the name of a single viroid or virus were also performed when data gathered from the other sources were not available or not considered sufficient. Further references and information were obtained from experts and from citations within primary references.

2.1.2. Database search

Information on host(s) and distribution of viruses were retrieved from the European and Mediterranean Plant Protection Organization (EPPO) Global Database (EPPO, 2017), the Centre for Agriculture and Biosciences International (CABI) and relevant publications.

Once the first listing of non-EU viruses and viruses with undetermined standing was prepared, data on host range and geographic distribution was completed by further searches using the GenBank genetic sequence database (https://www.ncbi.nlm.nih.gov/genbank/) (last access 19 March 2018), applying the following strategy:

- Search for "virus name";
- Select the virus name within the "Results by taxon";
- Open the obtained list using the "GenBank format" option;
- Search for "host" as keyword (host range completeness);
- Search for "country" as keyword (country distribution completeness).

GenBank accessions referring to viruses from EU countries or hosts not included in the initial table were added.

Information on virus taxonomy was gathered from the "Virus Taxonomy: 2017 Release" (https://talk.ictvonline.org/taxonomy/), an updated official classification by the International Committee on Taxonomy of Viruses (ICTV). Information on the taxonomy of viruses not yet included in that ICTV classification was gathered from the primary literature source describing them.

2.2. Methodologies

A preliminary list of viruses infecting *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. was generated based on expert knowledge. The list was progressively implemented with information gathered from literature and database searches.

Collected information was used to fill an extraction table (Annex A) with data regarding taxonomy, geographical distribution and host range of each virus and key references and sources used to obtain that information. Taxonomy, distribution and host range are reported in the table using the following scheme:

- taxonomy was reported according to ICTV; when the virus was not classified yet information on tentative classification was reported based on the original literature source in which the virus has been reported;
- data on distribution and host range of viruses were first searched in the EPPO global database (EPPO, 2018) and in CABI crop protection compendium (CABI, 2018). Whenever conclusive information was not identified in the two databases or the information retrieved was at odds with expert knowledge, extensive literature searches according to the protocol reported in Section 2.1 were performed.

Extensive literature searches were carried out and when the information was sufficient to consider a virus as non-EU or as having significant presence in the EU, literature searches were not further extended; as a consequence, the information provided here on virus distribution is not necessarily exhaustive.

With the advent of HTS technologies, new viruses infecting the genera under consideration are constantly published. Any virus described or published posterior to the last access of databases (19 March 2018) is not included in the present opinion and will not be included in further categorisation efforts.

Because only the non-EU viruses and the viruses with undetermined standing will be subject to further categorisation efforts in the frame of the present mandate, it was decided to have consultation phases with MSs so that they could provide additional inputs if they felt necessary. The information provided by MSs was then considered by the Panel in order to reach a final listing of the non-EU viruses and of the viruses with undetermined standing that will be further categorised. The viruses excluded from these two groups are therefore referred to in the present opinion as viruses excluded from further categorisation in the frame of the present mandate.

3. Listing of non-EU viruses and viroids

For better clarity, the host groups under consideration in this opinion, *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. are hereinafter called host plants. Viruses and viroids, although different biological categories, are summarised as viruses.

The pathogens addressed either have narrow host ranges and are thus found only on one or more of the host genera addressed here or can infect a wider range of plant species.

Because viruses in general have RNA/DNA genomes distinct from their hosts, viral sequences can be identified from a global assessment of plant-derived sequences using HTS approaches. Because these new methods have only been recently available, many new viruses have been reported from plant analyses that were not connected with disease studies. Furthermore, virus sequences have been reported from diseased plants but without demonstration of a causal role of the virus. In both cases, further biological or virus distribution data are generally missing/pending.

Viruses reported from the host plants under consideration have been first included in a master list (Annex A) and then grouped as follows.

3.1. Viruses considered as non-EU

Viruses considered as non-EU (Appendix A) correspond to two scenarios:

- Viruses not known to be present in the EU,
- Viruses known to be present outside the EU and with only limited presence (i.e. reported in only one or few MSs, known to have restricted distribution, outbreaks) in the EU.

Widely different amounts of information are available for these agents, from very well-known viruses that cause well established diseases in their host plants and for which well-known data set of biological data (host range, transmission), genome data and geographic distribution is available to very recently described viruses from HTS data, for which no information is available outside of sequence data.

3.2. Viruses excluded from further categorisation in the frame of the present mandate

Viruses excluded from further categorisation in the frame of the present mandate (Appendix B) correspond to two scenarios:

- Viruses reported only from the EU,
- Viruses known to be present outside the EU, but with a significant presence also in EU (known to occur in several MSs, frequently reported in the EU, widespread in some MSs).

It should be stressed that between relatively clear-cut cases of widespread and very limited presence in the EU, a grey zone exists where it is difficult to decide whether an agent should be considered as non-EU or not. The Panel tried to take into consideration such parameters as the number of EU MSs with known presence, the prevalence within individual MSs and prevalence outside the EU. However, information is frequently limited, severely complicating the assessment. In some cases, the Panel was unable to conclude and instead decided to include these viruses in a specific list of viruses with undetermined standing (see Section 3.3).

Variable amounts of information are available for viruses with a significant presence also in EU or reported only from the EU. However, this is less critical because these viruses will not be addressed in further categorisation efforts by EFSA according to the present mandate.

3.3. Viruses with undetermined standing

As outlined in Section 3.2, viruses with undetermined standing (Appendix C) correspond to situations for which, due to the limited information available and/or to the balanced distribution of the virus within and outside the EU, the Panel was unable to allocate the virus to the group of non-EU viruses or to the group of viruses excluded from further categorisation in the frame of the present mandate.

These viruses with undetermined standing will be addressed in future categorisation effort by EFSA according to the present mandate.

4. Uncertainty

- The geographic distribution and prevalence of the viruses analysed, in particular when they were recently described;
- The taxonomy and biological status of a number of poorly characterised viruses. Viral sequences (HTS or partial) originating from the host under consideration may not represent true plant viruses or the virus may infect other organisms associated with the analysed plant such as endophytic fungi;
- The host status of particular plant genera for some viruses. In some cases, viruses have been reported from the hosts under consideration only once and on poorly documented bases.

5. Conclusions

EFSA was requested by the European Commission to produce a pest categorisation of 133 harmful organisms or groups listed in annexes of Directive 2000/29/EC.

One of the groups for which the categorisation will be prepared is 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. As a first step, a systematic approach identified 197 viruses reported to naturally infect one or more of these genera. Among these viruses, based on information on virus distribution and prevalence both inside and outside EU, the Panel identified 86 non-EU viruses, known to occur only outside the EU or having only limited presence in the EU, and 14 viruses with undetermined standing. These viruses will be further categorised in next steps. The remaining 97 viruses, which have a significant presence in the EU or so far reported only from the EU, will not be categorised in the frame of the current mandate. However, the Commission may, at any time, present a request to EFSA to categorise some or all the viruses excluded from the current categorisation.

The main knowledge gaps and uncertainties of this listing concern (i) the geographic distribution and prevalence of the viruses analysed, in particular when they were recently described; (ii) the taxonomy and biological status of a number of poorly characterised viruses; and (iii) the host status of particular plant genera in relation to some viruses.

References

AAB descriptions of plant viruses, N42: Available online: http://www.dpvweb.net/dpv/showdpv.php?dpvno=42

Abou Ghanem-Sabanadzovic N, Mahboubi M, Di Terlizzi B, Sabanadzovic S, Savino V, Uyemoto JK and Martelli GP, 2001. Molecular detection of a closterovirus associated with apricot stem pitting in southern Italy. Journal of Plant Pathology, 83, 125–132.

Abou Ghanem-Sabanadzovic N, Tzanetakis IE and Sabanadzovic S, 2013. Rubus canadensis virus 1, a novel betaflexivirus identified in blackberry. Archives of Virology, 158, 445–449.

Abou Ghanem-Sabanadzovic N, Maliogka V and Sabanadzovic S, 2017. Grapevine leafroll-associated virus 4. In: Meng B, Martelli GP, Golino D and Fuchs M (eds). Grapevine Viruses: Molecular Biology, Diagnostics and Management. Springer, Dordrecht, The Netherlands. pp. 197–220.

Al Rwahnih M, Daubert S, Sudarshana MR and Rowhani A, 2013. Gene from a novel plant virus satellite from grapevine identifies a viral satellite lineage. Virus Genes, 47, 114–118.

Al Rwahnih M, Daubert S, Islas C, Golino D and Rowhani A, 2014. Characterization of a fifth vitivirus in grapevine. Journal of Plant Pathology, 96, 219–222.

Al Rwahnih M, Alabi OJ, Westrick NM, Golino D and Rowhani A, 2016. Near-complete genome sequence of grapevine fabavirus, a novel putative member in the genus *Fabavirus*. Genome Announcements, 4, e00703–e00716.

Al Rwahnih M, Alabi OJ, Westrick NM, Golino D and Rowhani A, 2017a. Description of a novel monopartite geminivirus and its defective subviral genome in grapevine. Phytopathology, 107, 240–251.

Al Rwahnih M, Saldarelli P and Rowhani A, 2017b. Grapevine leafroll-associated virus 7. In: Meng B, Martelli GP, Golino D and Fuchs M (eds.). Grapevine Viruses: Molecular Biology, Diagnostics and Management. Springer, Dordrecht, The Netherlands. pp. 221–228.

Al Rwahnih M, Golino D, Daubert S and Rowhani A, 2015. Characterization of a novel reovirus species in Cabernet Grapevine in California. In Proceedings of the 18th ICVG congress, Ankara, September 7–11, 2015, 194–195.

Amenduni T, Hobeika C, Minafra A, Boscia D, Castellano MA and Savino V, 2005. Plum bark necrosis stem pitting-associated virus in different stone fruit species in Italy. Journal of Plant Pathology, 87, 131–134.

Angelini E, Aboughanem-Sabanadzovic N, Dolja V and Meng B, 2017. Grapevine leafroll-associated virus 2. In: Meng B, Martelli GP, Golino D and Fuchs M (eds.). Grapevine Viruses: Molecular Biology, Diagnostics and Management. Springer, Dordrecht, The Netherlands. pp. 141–165.

Avgelis A and Barba M, 2011. Epirus cherry virus. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 151–152.

Avgelis AD and Rumbos IC, 1991. Carnation mottle virus isolated from vines affected with "Roditis leaf discoloration". 10th Proceedings ICVG, pp. 437-443.

Bag S, Al Rwahnih M, Li A, Gonzalez A, Rowhani A, Uyemoto JK and Sudarshana MR, 2015. Detection of a new luteovirus in imported nectarine trees: a case study to propose adoption of metagenomics in post-entry quarantine. Phytopathology, 105, 840–846.

Bahder BW, Zalom FG and Sudarshana MS, 2016. An evaluation of the flora adjacent to wine grape vineyards for the presence of alternative host plants of grapevine red blotch-associated virus. Plant Disease, 100, 1571–1574.

Basso MF, Ferreira da Silva JC, Martins Fajardo TV, Fontes EPB and Zerbini FM, 2015. A novel, highly divergent ssDNA virus identified in Brazil infecting apple, pear and grapevine. Virus Research, 210, 27–33.

Besse S, Gugerli P, Ramel ME and Balmelli C, 2010. Characterization of mixed virus infections in *Ribes* species in Switzerland. Julius-Kühn-Archiv, 427, 214–219.

Beuve M, Moury B, Spilmont AS, Sempé-Ignatovic L, Hemmer C and Lemaire O, 2013. Viral sanitary status of declining grapevine Syrah clones and genetic diversity of Grapevine Rupestris stem pitting-associated virus. European Journal of Plant Pathology, 135, 439–452.

Blouin AG, Pearson MN, Chavan RR, Woo ENY, Lebas BSM, Veerakone S, Ratti C, Biccheri R, MacDiarmid RM and Cohen D, 2013. Viruses of kiwifruit (*Actinidia* species). Journal of Plant Pathology, 95, 221–235.

Blouin AG, Chooi KM, Warren B, Napier KR, Barrero RA and MacDiarmid RM, 2018a. Grapevine virus I, a putative new vitivirus detected in co-infection with grapevine virus G in New Zealand. Archives of Virology, 163, 1371–1374. https://doi.org/10.1007/s00705-018-3738-5

Blouin AG, Keenan S, Napier KR, Barrero RA and MacDiarmid RM, 2018b. Identification of a novel vitivirus from grapevines in New Zealand. Archives of Virology, 163, 281–284.

Boscia D, Myrta A and Uyemoto JK, 2011. Plum bark necrosis stem pitting-associated virus. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 177–179.

Büttner C, von Bargen S, Bandte M and Myrta A, 2011. Cherry leaf roll virus. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 119–125.

CABI, 2018. CABI, current year. Crop Protection Compendium. Wallingford, UK: CAB International. Available online: www.cabi.org/cpc [Accessed: 15 January 2018 to 19 March 2018].

Caglayan K, Ulubas Serce U, Gazel M and Varveri C, 2011. Prune dwarf virus. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 199–205.

Campbell AI and Sparks TR, 1976. Experiments with dapple apple virus. Acta Horticulturae, 67, 261–264.

Candresse T, Liberti D, Barone M, Marais A and Ragozzino A, 2011a. Apricot pseudo-chlorotic leaf spot virus. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 103–106.

Candresse T, Marais Svanella-Dumas L and Gentit P, 2011b. Stocky prune virus. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 215–217.
Candresse T, Faure C, Theil S and Spilmont AS, 2017a. First report of grapevine hammerhead viroid-like RNA infecting grapevine (*Vitis vinifera*) in France. Plant Disease, 101, 2155.
Candresse T, Faure C, Theil S, Beuve M, Lemaire O, Spilmont AS and Marais A, 2017b. First report of grapevine asteroid mosaic-associated virus infecting grapevine (*Vitis vinifera*) in France. Plant Disease, 101, 1061.
Candresse T, Theil S, Faure C and Marais A, 2018. Determination of the complete genomic sequence of grapevine virus H, a novel vitivirus infecting grapevine. Archives of Virology, 163, 277–280.
Castrovilli S, Savino V, Castellano MA and Engelbrecht DJ, 1985. Characterization of a grapevine isolate of broad bean wilt virus. Phytopathologia Mediterranea, 24, 35–40.
Chabbouh N, Martelli GP, Savino V, Greco N and Lafortezza R, 1993. Potato virus X in Tunisian grapevines. Vitis, 32, 165–169.
Chandel V, Rana T, Handa A, Thakur PD, Hallan V and Zaidi AA, 2008. Incidence of prunus necrotic ring spot on *Malus domestica* in India. Journal of Phytopathology, 156, 382–384.
Chen L, Shang QX, Chen XY, Xing DM, Yang R, Han CG, Ran C, Wei XM, Zhao XY and Liu ZP, 2014. First report of the occurrence of cucumber mosaic virus on *Fragaria ananassa* in China. Plant Disease, 98, 1015.
Cieniewicz E, Perry K and Fuchs M, 2017. Grapevine red blotch: molecular biology of the virus and management of the disease. In: Meng B, Martelli GP, Golino D and Fuchs M (eds.). Grapevine Viruses: Molecular Biology, Diagnostics and Management. Springer, Dordrecht, The Netherlands. pp. 303–314.
Cieślińska M and Malinowski T, 2002. Virus and virus-like diseases of fruit trees and small fruits. Zeszyty Naukowe Instytutu Sadownictwa i Kwiaciarstwa w Skierniewicach, 10, 197–206.
Cox S, Mayo MA and Jones AT, 2000. The occurrence of dsRNA species in apparently healthy and virus-infected *Ribes* cultivars, and evidence that one such species originates from a member of the virus family *Totiviridae*. European Journal of Plant Pathology, 106, 353–364.
Cretazzo E and Velasco L, 2017. High-throughput sequencing allowed the completion of the genome of genome of grapevine red globe virus and revealed recurring co-infection with other tymoviruses in grapevine. Plant Pathology, 66, 1202–1213.
Cseh E, Takács A, Kocsis L and Gáborjányi R, 2012. General properties of grapevine viruses occurring in Hungary. Journal of Central European Agriculture, 13, 44–57.
Czotter N, Molnar J, Szabo E, Kontra L, Baksa I, Szittya G, Kocsis L, Deak T, Biztray G, Tusnady G, Burgyan J and Varallyay E, 2018. NGS of virus-derived small RNAs as a diagnostic method used to determine viromes of Hungarian vineyards. Frontiers in Microbiology, 9, 122. https://doi.org/10.3389/fmicb.2018.00122
Di Serio F, Torchetti EM, Flores R and Sano T, 2017. Other apscanviroids infecting pome fruit trees. In: Hadidi A, Flores R, Randles JW and Palukaitis P (eds). Viroids and Satellites. Elsevier, London, UK. pp. 229–241.
Diaz-Lara A, Mosier NJ, Keller KE and Martin RR, 2015. A variant of Rubus yellow net virus with altered genomic organization. Virus Genes, 50, 104–110.
Digiaro M, Elbeaino T and Martelli GP, 2017. Grapevine fanleaf virus and other Old World nepoviruses. In: Meng B, Martelli GP, Golino D and Fuchs M (eds.). Grapevine Viruses: Molecular Biology, Diagnostics and Management. Springer, Dordrecht, The Netherlands. pp. 47–82.
Ding X, Li Y, Hernández-Sebastià Abbasi PA, Fisher P, Celetti MJ and Wang A, 2016. First report of strawberry crinivirus 4 on strawberry in Canada. Plant Disease, 100, 1254.
Dolja VV, Meng B and Martelli GP, 2017. Evolutionary aspects of grapevine virology. In: Meng B, Martelli GP, Golino D and Fuchs M (eds.). Grapevine Viruses: Molecular Biology, Diagnostics and Management. Springer, Dordrecht, The Netherlands. pp. 659–688.
Dombrovsky A, Pearlsman M, Lachman O and Antignus Y, 2009. Characterization of a new strain of Eggplant mottled crinkle virus (EMCV) infecting eggplant in Israel. Phytoparasitica, 37, 477–483.
EFSA PLH Panel (EFSA Panel on Plant Health), 2011. Scientific Opinion on the assessment of the risk of solanaceous pospiviroids for the EU territory and the identification and evaluation of risk management options. EFSA Journal 2011;9(8):2330, 133 pp. https://doi.org/10.2903/j.efsa.2011.2330
EFSA PLH Panel (EFSA Panel on Plant Health), 2012. Scientific Opinion on the pest categorisation of the tospoviruses. EFSA Journal 2012;10(7):2772, 101 pp. https://doi.org/10.2903/j.efsa.2012.2772
EFSA PLH Panel (EFSA Panel on Plant Health), 2013a. Scientific opinion on the risks posed by *Prunus* pollen, as well as pollen from seven additional plant genera, for the introduction of viruses and virus-like organisms into the EU. EFSA Journal 2013;11(10):3375, 50 pp. https://doi.org/10.2903/j.efsa.2013.3375
EFSA PLH Panel (EFSA Panel on Plant Health), 2013b. Scientific opinion on the risk to plant health posed by Arabis mosaic virus, Raspberry ringspot virus, Strawberry latent ringspot virus and Tomato black ring virus to the EU territory with the identification and evaluation of risk reduction options. EFSA Journal 2013;11(10):3377, 83 pp. https://doi.org/10.2903/j.efsa.2013.3377
EFSA PLH Panel (EFSA Panel on Plant Health), 2014a. Scientific Opinion on the pest categorisation of Strawberry latent C virus. EFSA Journal 2014;12(7):3771, 22 pp. https://doi.org/10.2903/j.efsa.2014.3771
EFSA PLH Panel (EFSA Panel on Plant Health), 2014b. Scientific Opinion on the pest categorisation of Strawberry vein banding virus. EFSA Journal 2014;12(7):3772, 22 pp. https://doi.org/10.2903/j.efsa.2014.3772

EFSA PLH Panel (EFSA Panel on Plant Health), 2014c. Scientific Opinion on the risk to plant health posed by Strawberry crinkle virus to the EU territory with the identification and evaluation of risk reduction options. EFSA Journal 2014;12(4):3630, 46 pp. https://doi.org/10.2903/j.efsa.2014.3630

EFSA PLH Panel (EFSA Panel on Plant Health), 2014d. Scientific Opinion on the risk to plant health posed by Strawberry mild yellow edge virus to the EU territory with the identification and evaluation of risk reduction options. EFSA Journal 2014;12(4):3629, 46 pp. https://doi.org/10.2903/j.efsa.2014.3629

EFSA PLH Panel (EFSA Panel on Plant Health), 2014e. Scientific Opinion on the pest categorisation of Prunus necrotic ringspot virus. EFSA Journal 2014;12(10):3849, 22 pp. https://doi.org/10.2903/j.efsa.2014.3849

EFSA PLH Panel (EFSA Panel on Plant Health), 2014f. Scientific Opinion on the pest categorisation of Cherry leafroll virus. EFSA Journal 2014;12(10):3848, 23 pp. https://doi.org/10.2903/j.efsa.2014.3848

EFSA PLH Panel (EFSA Panel on Plant Health), 2017. Scientific opinion on the pest categorisation of Little cherry pathogen (non-EU isolates). EFSA Journal 2017;15(7):4926, 27 pp. https://doi.org/10.2903/j.efsa.2017.4926

Eichmeier A, Kominova M, Kominek P and Baránek M, 2016. Comprehensive virus detection using next generation sequencing in grapevine vascular tissues of plants obtained from the wine regions of Bohemia and Moravia (Czech Republic). PLoS ONE, 11, e0167966. https://doi.org/10.1371/journal.pone.0167966

Elbeaino T, Giampetruzzi A, De Stradis A and Digiaro M, 2014. Deep-sequencing analysis of an apricot tree with vein clearing symptoms reveals the presence of a novel betaflexivirus. Virus Research, 181, 1–5.

El-gaied LF, Salama MI, Salem AM, Nour El-deen AF and Abdallah NA, 2008. Molecular and serological studies on a plant virus affecting strawberry. Arab Journal of Biotechnology, 11, 303–314.

EPPO (European and Mediterranean Plant Protection Organization), 2018. EPPO Global Database. Available online: https://gd.eppo.int [Accessed: 15 January 2018 to 19 March 2018].

EPPO Bulletin, 2017. PM 7/2 (2) Tobacco ringspot virus. Bulletin OEPP/EPPO Bulletin, 47(2), 135–145.

Espach Y, Maree HJ and Burger JT, 2012. Complete genome of a novel endornavirus assembled from next-generation sequence data. Journal of Virology, 86, 13142.

Esteves F, Texeira Santos M, Eiras-Dias JE and Fonseca F, 2012. Occurrence of grapevine leafroll-associated virus 5 in Portugal: genetic variability and population structure in field-grown grapevines. Archives of Virology, 157, 1747–1765.

Faggioli F, Riccioni L, Mazzei M and Barba M, 1992. Purification and characterization of a new virus found in grapevine. Phytopathologia Mediterranea, 31, 37–40.

Fagundes Silva JM, Al Rwahnih M, Blawid R, Nagata T and Martins Fajardo TV, 2017. Discovery and molecular characterization of a novel enamovirus, Grapevine enamovirus-1. Virus Genes, 53, 667–671.

Fiore N, Zamorano A, Sanchez-Diana N, Gonzalez X, Pallas V and Sanchez-Navarro J, 2016. First detection of Grapevine rupestris stem pitting-associated virus and Grapevine rupestris vein feathering virus, and new phylogenetic groups for Grapevine fleck virus and Hop stunt viroid isolates, revealed from grapevine field surveys in Spain. Phytopathologia Mediterranea, 55, 225–238.

Flores R, Duran-Vila N, Pallas V and Semancik JS, 1985. Detection of viroid and viroid-like RNAs from grapevine. Journal of General Virology, 66, 2095–2102.

Gambino G, Navarro B, Torchetti EM, La Notte P, Schneider A, Mannini F and Di Serio F, 2014. Survey on viroids infecting grapevine in Italy: identification and characterization of Australian grapevine viroid and Grapevine yellow speckle viroid 2. European Journal of Plant Pathology, 140, 199–205.

Garcia-Ibarra A, Martinez-Gomez P, Rubio M, Dicenta F, Soler A, Pallas V and Sanchez-Navarro J, 2010. First report of Apricot latent virus and Plum bark necrosis stem pitting-associated virus in apricot from Spain. Plant Disease, 94, 275.

Gentit P, Delbos RP, Candresse T and Dunez J, 2001. Characterization of a new nepovirus infecting apricot in Southeastern France: apricot latent ringspot virus. European Journal of Plant Pathology, 107, 485–494.

Gentit P, Foissac X, Svanella-Dumas L, Peypelut M, Macquaire G and Candresse T, 2002. Molecular characterization of foveaviruses associated with the cherry necrotic mottle leaf disease and complete sequencing of an European isolate of cherry green ring mottle virus. Archives of Virology, 147, 1033–1042.

Giampetruzzi A, Roumi V, Roberto R, Malossini U, Yoshikawa N, La Notte P, Terlizzi F, Credi R and Saldarelli P, 2012. A new grapevine virus discovered by deep sequencing of virus- and viroid-derived small RNAs in Cv Pinot gris. Virus Research, 163, 262–268.

Glasa M, Predajna L, Soltys K, Sabanadzovic S and Olmos A, 2015. Detection and molecular characterization of Grapevine Syrah virus-1 isolates from Central Europe. Virus Genes, 51, 112–121.

Glasa M, Soltys K, Vozárová Z, Predajna L, Sihelská N, Subr Z and Candresse T, 2017. High intra-host cherry virus A population heterogeneity in cherry trees in Slovakia. Journal of Plant Pathology, 99, 745–752.

Gouveia P, Teixeira Santos M, Eiras-Dias JE and Nolasco G, 2011. Five phylogenetic groups identified in the coat protein gene of grapevine leafroll-associated virus 3 obtained from Portuguese grapevine varieties. Archives of Virology, 156, 413–420.

Grimova L and Rysanek P, 2012. Apricot latent virus – Review. Horticultural Science, 39, 144–148.

Habili N, 2017. Apscaviroids infecting grapevine. In: Hadidi A, Flores R, Randles JW and Palukaitis P (eds.). Viroids and Satellites. Elsevier, London, UK. pp. 251–262.

Hadidi A and Barba M, 2011. Apple scar skin viroid. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 57–62.

Hadidi A, Barba M, Candresse T and Jelkmann W, 2011. Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA.
Hadidi A, Barba M, Hong N and Hallan V, 2017a. Apple scar skin viroid. In: Hadidi A, Flores R, Randles JW and Palukaitis P (eds.). Viroids and Satellites. Elsevier, London, UK. pp. 217–228.
Hadidi A, Flores R, Randles JW and Palukaitis P, 2017b. Viroids and Satellites. Elsevier, London, UK.
Hanzlikova-Vaskova S, Spak J and Petrzik K, 2006. Variability in sequence of Strawberry vein banding virus. Biologia Plantarum, 50, 660–666.
Hassan M, Di Bello PL, Keller KE, Martin RR, Sabanadzovic S and Tzanetakis IE, 2017. A new, widespread emaravirus discovered in blackberry. Virus Research, 235, 1–5.
He Y, Cai L, Zhou L, Yang Z, Hong N, Wang G, Li S and Xu W, 2017. Deep sequencing reveals the first fabavirus infecting peach. Scientific Reports, 7, 11329. https://doi.org/10.1038/s41598-017-11743-7
Hu GJ, Dong F, Zhang ZP, Fan XD, Ren F, Li N and Zhou J, 2016a. First report of Prunus necrotic ringspot virus infection of apple in China. Plant Disease, 100, 1955.
Hu Y, Shi HW, Jing CC, Li K, Sun XC, Wu GT, Zhou CY and Qing L, 2016b. First report of cucumber mosaic virus infecting apple in China. Journal of Plant Pathology, 98, 181.
Igori D, Lim S, Baek D, Kim SY, Seo E, Cho IS, Choi CS, Lim HS and Moon JS, 2017. Complete nucleotide sequence and genome organization of peach virus D, a putative member of the genus *Marafivirus*. Archives of Virology, 162, 1769–1772.
Immanuel TM, Delmiglio C, Ward LI, Denton JO and Clover GRG, 2015. First reports of Grapevine virus A, Grapevine fleck virus, and Grapevine leafroll-associated virus 1 in the United Kingdom. Plant Disease, 99, 898.
Ito T and Nakaune R, 2016. Molecular characterization of a novel putative ampelovirus tentatively named grapevine leafroll-associated virus 13. Archives of Virology, 161, 2555–2559.
James D, 2011a. Cherry mottle leaf virus. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 127–131.
James D, 2011b. Cherry rasp leaf virus. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 137–141.
James D, 2011c. Cherry twisted leaf disease and its associated viruses. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 143–146.
James D, Varga A and Lye D, 2014. Analysis of the complete genome of a virus associated with twisted leaf disease of cherry reveals evidence of a close relationship to unassigned viruses in the family Betaflexiviridae. Archives of virology, 159, 2463–2468.
James D and Phelan J, 2016. Complete genome sequence of a strain of Actinidia virus X detected in *Ribes nigrum* cv. Baldwin showing unusual symptoms. Archives of Virology, 161, 507–511.
James D and Phelan J, 2017. Complete genome sequence and analysis of blackcurrant leaf chlorosis associated virus, a new member of the genus Idaeovirus. Archives of Virology, 162, 1705–1709.
James D, Varga A and Croft H, 2007. Analysis of the complete genome of peach chlorotic mottle virus: identification of a non-AUG start codons, in vitro coat protein expression, and elucidation of serological cross-reactions. Archives of Virology, 152, 2207–2215.
James D, Varga A, Jesperson GD, Navratil M, Safarova D, Constable F, Horner M, Eastwell K and Jelkmann W, 2013. Identification and complete genome analysis of a virus variant or putative new foveavirus associated with apple green crinkle disease. Archives of Virology, 158, 1877–1887.
Jelkmann W, 2011. Cherry detrimental canker. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 111–114.
Jelkmann W and Eastwell KC, 2011. Little cherry virus-1 and 2. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 153–159.
Jelkmann W and Paunovic S, 2011. Apple stem pitting virus. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 35–40.
Jo Y, Song MK, Park JS, Lee JW, Lian S, Lee BC and Cho WK, 2017a. Genome sequence of grapevine virus K, a novel vitivirus infecting grapevine. Genome Announcements, 5, e00994–17.
Jo Y, Song MK, Choi H, Park JS, Lee JW, Lian S, Lee BC and Cho WK, 2017b. Genome sequence of grapevine virus T, a novel foveavirus infecting grapevine. Genome Announcements, 5, e00995–17.
Jones AT, 1977. Partial purification and some properties of wineberry latent, a virus obtained from *Rubus phoenicolasius*. Annals of Applied Biology, 86, 199–208.
Jones AT, Roberts IM and Murant AF, 1974. Association of different kinds of bacilliform particle with vein chlorosis and mosaic diseases of raspberry (*Rubus idaeus*). Annals of Applied Biology, 77, 283–288.
Jones AT, McGavin WJ, Geering ADW and Lockhart BEL, 2001. A new badnavirus in *Ribes* species, its detection by PCR, and its close association with gooseberry vein banding disease. Plant Disease, 85, 417–422.
Kaponi MS, Luigi M, Barba M and Kyriakopoulou PE, 2010. Pospiviroidae viroids in naturally infected stone and pome fruits in Greece. Julius-Kuhn-Archiv, 427, 353–356.
Kargar M, Zakiaghi M, Masoumi M, Mehrvar M and Izadpanah K, 2017. Analysis of genetic diversity of Grapevine fanleaf virus isolate from Fars and Kohgiluyeh-Boyer Ahmad provinces. Iranian Journal of Plant Pathology, 52, 375–391.

Kinoti WM, Constable FE, Nancarrow N, Plummer KM and Rodoni B, 2017. Generic amplicon deep sequencing to determine Ilarvirus species diversity in Australian *Prunus*. Frontiers in Microbiology, 8, 1219. https://doi.org/10.3389/fmicb.2017.01219

Kirby MJ, Kirby MJ and Adams AN, 2001. Occurrence of Cherry virus A in the UK. Plant Pathology, 50, 801.

Kishi K, Abiko K and Takanashi K, 1973. Studies on the virus diseases of stone fruit IX. A new virus disease, peach enation. Ann. Phytopath. Soc. Japan, 39, 373.

Koganezawa H and Ito T, 2011. Apple latent spherical virus. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 23–24.

Kominek P, Glasa M and Bryxiova M, 2005. Analysis of the molecular variability of Grapevine Leafroll-associated virus 1 reveals the presence of two distinct virus groups and their mixed occurrence in grapevine. Virus Genes, 31, 247–255.

Komorowska B and Cieslinska M, 2005. First report of Cherry green ring mottle virus on Sweet Cherry in Poland. Plant Disease, 89, 1363.

Komorowska B, Berniak H and Golis T, 2014. Detection of grapevine viruses in Poland. Journal of Phytopathology, 162, 326–331.

Krenz B, Thompson JR, Fuchs M and Perry KL, 2012. Complete genome sequence of a new circular DNA virus from grapevine. Journal of Virology, 86, 7715.

Krizbai L, Kriston E, Kreuze J and Melika G, 2017. Identification of Nectarine stem pitting-associated virus infecting *Prunus persica* in Hungary. New Disease Reports, 35, 18.

Kyriakopoulou PE, Giunchedi L and Hadidi A, 2001. Peach latent mosaic and pome fruit viroids in naturally infected cultivated pear *Pyrus communis* and wild pear *P. amygdaliformis*: implications on possible origins of these viroids in the Mediterranean region. Journal of Plant Pathology, 83, 51–62.

Kyriakopoulou PE, Giunchedi L, Barba M, Boubourakas IN, Kaponi M and Hadidi A, 2017. In: Hadidi A, Flores R, Randles JW and Palukaitis P (eds). Viroids and Satellites. Elsevier, London, UK. pp. 317–330.

Larsen HJ and James D, 2011. Peach mosaic virus. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 171–175.

Le Maguet J, Fuchs JJ, Chadoeuf J, Beuve M, Herrbach E and Lemaire O, 2013. The role of the mealybug *Phenacoccus aceris* in the spread of Grapevine leafroll-associated virus -1 (GLRaV-1) in two French vineyards. European Journal of Plant Pathology, 135, 415–427.

Lenz O, Pribylova J, Fránová Koloniuk I and Spak J, 2017. Identification and characterization of a new member of the genus *Luteovirus* from cherry. Archives of Virology, 162, 587–590.

Lesemann DE, Kunze L, Krischke G and Koenig R, 1989. Natural occurrence of carnation Italian ringspot virus in a cherry tree. Journal of Phytopathology, 124, 171–174.

Liang P, Navarro B, Zhang Z, Wang H, Lu M, Xiao H, Wu Q, Zhou X, Di Serio F and Li S, 2015. Identification and characterization of a novel geminivirus with a monopartite genome infecting apple trees. Journal of General Virology, 96, 2411–2240.

Marais A, Svanella-Dumas L, Foissac X, Gentit P and Candresse T, 2006. Asian prunus viruses: New related members of the family *Flexiviridae* in *Prunus* germplasm of Asian origin. Virus Research, 120, 176–183.

Marais A, Candresse T, Svanella-Dumas L and Jelkmann W, 2011. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 147–150.

Marais A, Faure C, Couture C, Bergey B, Gentit P and Candresse T, 2014. Characterization by deep sequencing of divergent plum bark necrosis stem pitting-associated virus (PBNSPaV) isolates and development of a broad-spectrum PBNSPaV detection assay. Phytopathology, 104, 660–666.

Marais A, Faure C, Mustafayev E and Candresse T, 2015a. Characterization of new isolates of Apricot vein clearing-associated virus and of a new *Prunus*-infecting virus: Evidence for recombination as a driving force in *Betaflexiviridae* evolution. PLoS ONE, 10, e0129469.

Marais A, Faure C, Mustafayev E, Barone M, Alioto D and Candresse T, 2015b. Characterization by deep sequencing of prunus virus T, a novel Tepovirus infecting *Prunus* species. Phytopathology, 105, 135–140.

Maree HJ, Almeida RPP, Bester R, Chooi KM, Cohen D, Dolja VV, Fuchs MF, Golino DA, Jooste AEC, Martelli GP, Naidu RA, Rowhani A, Saldarelli P and Burger J, 2013. Grapevine leafroll-associated virus 3. Frontiers in Microbiology, 4, 82.

Martelli GP, 2014. Directory of virus and virus-like diseases of the grapevine and their agents. Journal of Plant Pathology, 96, 1–136.

Martelli GP, 2017. An overview on grapevine viruses, viroids, and the disease they cause. In: Meng B, Martelli GP, Golino D and Fuchs M (eds.). Grapevine Viruses: Molecular Biology, Diagnostics and Management. Springer, Dordrecht, The Netherlands. pp. 31–46.

Martelli GP and Uyemoto JK, 2011. Nematode-borne viruses of stone fruits. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 161–170.

Martelli GP, Flores R and Schneider B, 2011. Classification of pome and stone fruit viruses, viroids, and phytoplasmas. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 13–16.

Martelli GP, Abou Ghanem-Sabanadzovic N, Agranowsky AA, Al Rwahnih M, Dolja VV, Dovas CI, Fuchs M, Gugerli P, Hu JS, Jelkmann W, Katis NI, Maliogka VI, Melzer MJ, Menzel W, Minafra A, Rott ME, Rowhani A, Sabanadzovic S and Saldarelli P, 2012. Taxonomic revision of the family *Closteroviridae* with special reference to the grapevine leafroll-associated members of the genus *Ampelovirus* and the putative species unassigned to the family. Journal of Plant Pathology, 94, 7–19.

Martelli GP, Golino DA and Katis NI, 2017. Other grapevine viruses of lesser economic importance. In: Meng B, Martelli GP, Golino D and Fuchs M (eds.). Grapevine Viruses: Molecular Biology, Diagnostics and Management. Springer, Dordrecht, The Netherlands. pp. 365–371.

Martin RR and Tzanetakis IE, 2006. Characterization and recent advances in detection of strawberry viruses. Plant Disease, 90, 384–396.

Martin RR, MacFarlane S, Sabanadzovic S, Quito D, Poudel B and Tzanetakis IE, 2013. Virus and virus diseases of *Rubus*. Plant Disease, 97, 168–182.

Mavric Pleško I, Virscek Marn M, Sirca S and Urek G, 2009. Biological, serological and molecular characterization of Rasperry bushy dwarf virus from grapevine and its detection in the nematode *Longidorus juvenilis*. European Journal of Plant Pathology, 123, 261–268.

Mavric Pleško I, Virscek Marn M, Nyerges K and Lazar J, 2012. First report of raspberry bushy dwarf virus infecting grapevine in Hungary. Plant Disease, 96, 1582.

Mavric I, Virscek Marn M, Koron D and Zezlina I, 2003. First report of raspberry bushy dwarf virus on red raspberry and grapevine in Slovenia. Plant Disease, 87, 1148.

McGavin WJ and MacFarlane S, 2009. Rubus chlorotic mottle virus, a new sobemovirus infecting raspberry and bramble. Virus Research, 139, 10–13.

Meng B, Martelli GP, Golino D and Fuchs M, 2017. Grapevine Viruses: Molecular Biology. Diagnostics and Management, Springer, Dordrecht, The Netherlands.

Morelli M, Giampetruzzi A, Laghezza L, Catalano L, Savino VN and Saldarelli P, 2017. Identification and characterization of an isolate of apple green crinckle associated virus involved in a severe disease of quince (*Cydonia oblonga*, Mill.). Archives of Virology, 162, 299–306.

Namba SYS, Doi Y and Yora K, 1981. A small spherical virus associated with grapevine stunt disease. Ann. Phytopath. Soc. Japan, 43, 137.

Negi A, Rana T, Kumar Y, Ram R, Hallan V and Zaidi AA, 2010. Analysis of the coat protein gene of Indian strain of Apple stem grooving virus. Journal of Plant Biochemistry & Biotechnology, 19, 91–94.

Nemchinov LG, Gentit P, Zemcic E, Candresse T and Hadidi A, 2011. Apricot latent virus. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 97–101.

Nickel O and Fajardo TVM, 2014. Detection of viruses in apples and pears by real time RT-PCR using 5'-hydrolisis probes. Journal of Plant Pathology, 96, 207–213.

Noda H, Yamagishi N, Yaegashi H, Xing F, Xie J, Li S, Zhou T, Ito T and Yoshikawa N, 2017. Apple necrotic mosaic virus, a novel ilarvirus from mosaic-diseased apple trees in Japan and China. Journal of General Plant Pathology, 83, 83–90.

Osaki H and Sasaki A, 2018. A novel alphapartitivirus detected in Japanese pear. Virus Genes, 54, 149–154.

Osaki H, Sasaki A, Nakazono-Nakoda E, Ota N and Nakaune R, 2017. Genome segments encoding capsid protein-like variants of *Pyrus pyrifolia* criptic virus. Virus Research, 240, 64–68.

Padilla CV, Cretazzo E, Alcalá MJ, Hita I, Lopez N, Padilla V and Velasco L, 2013. First report of grapevine leafroll-associated virus 9 in Spain. Journal of Plant Pathology, 95, 662.

Paradies F, Finetti Sialer M, Gallitelli D, Castellano MA, Di Franco A, Digiaro M, Martelli GP and Yilmaz MA, 2000. Partial characterization of Cucumber mosaic virus isolates from citrus and grapevine. Journal of Plant Pathology, 82, 133–145.

Perry KL, McLane H, Thompson JR and Fuchs M, 2018. A novel grablovirus from non-cultivated grapevine (Vitis sp.) in North America. Archives of Virology, 163, 259–262.

Petrzik K, Pribylová J and Spak J, 2012. Molecular analysis of gooseberry vein banding associated virus. Acta Virologica, 56, 119–124.

Petrzik K, Koloniuk I, Pribylová J and Spak J, 2016a. Complete genome sequence of currant latent virus (genus *Cheravirus*, family *Secoviridae*). Archives of Virology, 161, 491–493.

Petrzik K, Pribylová J, Koloniuk I and Spak J, 2016b. Molecular characterization of a novel capillovirus from red currant. Archives of Virology, 161, 1083–1086.

Plant Viruses Online: Grapevine stunt virus. Available online: http://sdb.im.ac.cn/vide/descr374.htm

Poojari S, Alabi OJ, Fofanov VY and Naidu RA, 2013. A leafhopper-transmissible DNA virus with novel evolutionary lineage in the family *Geminiviridae* implicated in grapevine redleaf disease by next-generation sequencing. PLoS ONE, 8, e64194.

Ramsdell DC and Gillet JM, 1998. Peach rosette mosaic virus. AAB Description of Plant Viruses, 364, http://www.dpvweb.net/dpv/showdpv.php?dpvno=364.

Ratti C, Pisi A, Rubies Autonell C, Babini A and Vicchi V, 2009. First report of Strawberry vein banding virus on strawberry in Italy. Plant Disease, 93, 675.

Rizzo D, Materazzi A, Stefani L, Farina P, Vanarelli S, Panattoni A and Luvisi A, 2015. Distribution of regulated viruses in cv. Sangiovese vineyards in Tuscany. Journal of Plant Pathology, 97, 131–135.
Robertson NL, Quito-Avila DF and Martin RR, 2012. Alaskan *Ribes* L. and *Rubus* L. plant species surveyed for viruses. Acta Horticulturae, 946, 237–242.
Rott M and Jelkmann W, 2011. Cherry necrotic rusty mottle and Cherry rusty mottle viruses. In: Hadidi A, Barba M, Candresse T and Jelkmann W (eds.). Virus and Virus-Like Diseases of Pome and Stone Fruits. APS Press, St. Paul, MN, USA. pp. 133–136.
Rotunno S, Vaira AM, Marian D, Schneider A, Raimondi S, Di Serio F, Navarro B and Miozzi L, 2018. First report of grapevine latent viroid infecting grapevine (*Vitis vinifera* L) in Italy. Plant Disease, 102, 1672. https://doi.org/10.1094/PDIS-01-18-0076-PDN
Rubio M, Martinez-Gomez P, Marais A, Sánchez-Navarro JA, Pallás V and Candresse T, 2017. Recent Advances and prospects in *Prunus* virology. Annals of Applied Biology, 171, 125–138.
Ruiz Garcia AB, Okic A, Zarghani SN, Olmos A and Wertzel T, 2018. First report of grapevine virus T in grapevine in Germany. Plant Disease, https://doi.org/10.1094/PDIS-01-18-0161-PDN
Ruiz-Garcia AB, Sabaté J, Lloria O, Lavina A, Batlle A and Olmos A, 2017. First report of Grapevine Syrah virus-1 in grapevine in Spain. Plant Disease, 101, 1830.
Russo M, Vovlas C, Rubino L, Grieco F and Martelli GP, 2002. Molecular characterization of a tombusvirus isolated from diseased pear trees in southern Italy. Journal of Plant Pathology, 84, 161–166.
Russo M, De Stradis A and Vovlas C, 2008. A disease of *Limonium sinuatum* caused by carnation Italian ringspot virus. Journal of Plant Pathology, 90, 400.
Sabanadzovic S, 2009. Viruses of native Vitis germplasm in the southeastern United States. Extended Abstracts 16th Meeting of ICVG. , Dijon, France. pp. 32–35.
Sabanadzovic S, Aboughanem-Sabanadzovic N and Martelli GP, 2017. Grapevine fleck and similar viruses. In: Meng B, Martelli GP, Golino D and Fuchs M (eds.). Grapevine Viruses: Molecular Biology, Diagnostics and Management. Springer, Dordrecht, The Netherlands. pp. 331–349.
Safarova D, Navratil M, Paprstein F, Candresse T and Marais A, 2013. Cherry virus A infecting cherries and plums in the Czech Republic. Horticultural Science, 40, 37–39.
Safarova D, Faure C, Marais A, Sucha J, Paprstein F, Navratil M and Candresse T, 2017. First report of prunus virus F infecting sour cherry in the Czech Republic. Plant Disease, 101, 1828.
Saldarelli P, Gualandri V, Malossini U and Glasa M, 2017. Grapevine Pinot gris virus. In: Meng B, Martelli GP, Golino D and Fuchs M (eds.). Grapevine Viruses: Molecular Biology, Diagnostics and Management. Springer, Dordrecht, The Netherlands. pp. 351–363.
Shahid MS, Aboughanem-Sabanadzovic N, Sabanadzovic S and Tzanetakis IE, 2017. Genomic characterization and population structure of a badnavirus infecting blackberry. Plant Disease, 101, 110–115.
Sharma A, Ram R and Zaidi AA, 1998. *Rubus ellipticus*, a perennial weed host of prunus necrotic ring spot virus in India. Plant Disease, 82, 1283.
Shen P, Tian X, Zhang S, Ren F, Li P, Yu YQ, Li R, Zhou C and Cao M, 2018. Molecular characterization of a novel luteovirus infecting apple by next-generation sequencing. Archives of Virology, 163, 761–765.
Sliwa H, Kaminska M and Malinowski T, 2008. Detection and identification of cucumber mosaic virus isolate from red currant "Rosetta". Acta Horticulturae, 780, 55–60.
Spak J, Pribylová J, Safárová D, Lenz O, Koloniuk I, Navratil M, Fránová J, Spaková V and Paprstein F, 2017. Cherry necrotic rusty mottle and cherry green ring mottle viruses in Czech cherry germplasm. Plant Protection Science, 53, 195–200. https://doi.org/10.17221/160/2015-PPS
Thekke-Veetil T and Tzanetakis IE, 2016. First report of strawberry polerovirus-1 in strawberry in the United States. Plant Disease, 100, 867.
Thekke-Veetil T, Aboughanem-Sabanadzovic N, Keller KE, Martin RR, Sabanadzovic S and Tzanetakis IE, 2013. Molecular characterization and population structure of blackberry vein banding associated virus, new ampelovirus associated with yellow vein disease. Virus Research, 178, 234–240.
Thekke-Veetil T, Ho T, Postman JD and Tzanetakis IE, 2017. Characterization and detection of a novel idaeovirus infecting blackcurrant. European Journal of Plant Pathology, 149, 751–757.
Tzanetakis IE and Martin RR, 2005a. New features in the genus *Ilarvirus* revealed by the nucleotide sequence of Fragaria chiloensis latent virus. Virus Research, 112, 32–37.
Tzanetakis IE and Martin RR, 2005b. Fragaria chiloensis cryptic virus: a new strawberry virus found in *Fragaria chiloensis* plants from Chile. Plant Disease, 89, 1241.
Tzanetakis IE and Martin RR, 2013. Expanding field of strawberry viruses which are important in North America. International Journal of Fruit Science, 13, 184–195.
Tzanetakis IE, Halgren AB, Wintermantel WM, Keller KE and Martin RR, 2001. Two criniviruses are associated with the strawberry pallidosis disease. Acta Horticulturae, 656, 21–26.
Tzanetakis IE, Price R and Martin RR, 2008a. Nucleotide sequences of the tripartite Fragaria chiloensis cryptic virus and presence of the virus in the Americas. Virus Genes, 36, 267–272.
Tzanetakis IE, Bray M, Susaimuthu J, Gergerich RC and Martin RR, 2008b. Evidence of mixed infections causing severe symptoms and decline of blackberries. Acta Horticulturae, 777, 385–389.

Velasco L, Cretazzo E, Padilla CV and Janssen D, 2015. Grapevine leafroll associated virus 4 strain 9: complete genome and quantitative analysis of the virus-derived small interfering RNA populations. Journal of Plant Pathology, 97, 189–192.

Villamor DV, Druffel KL and Eastwell KC, 2013. Complete nucleotide sequence of a virus associated with rusty mottle disease of sweet cherry. Archives of Virology, 158, 1805–1810.

Villamor DEV, Mekuria TA, Pillai SS and Eastwell KC, 2016. High-throughput sequencing identifies novel viruses in nectarine: insights to the etiology of stem-pitting disease. Phytopathology, 106, 519–527.

Villamor DEV, Pillai SS and Eastwell KC, 2017. High throughput sequencing reveals a novel fabavirus infecting sweet cherry. Archives of Virology, 162, 811–816.

Voncina D, Almeida RP, 2018. Screening of some Croatian autochthonous grapevine varieties reveals a multitude of viruses, including novel ones. Archives of virology, (in Press) https://doi.org/10.1007/s00705-018-3850-6

Voncina D, Al Rwahnih M, Rowhani A, Gouran M and Almeida RPP, 2017. Viral diversity in autochthonous Croatian grapevine cultivars. Plant Disease, 101, 1230–1235.

Woo ENY and Pearson MN, 2014. Biological and molecular variation of Cherry leaf roll virus isolates from *Malus domestica, Ribes rubrum, Rubus idaeus, Rumex obtusifolius* and *Vaccinium darrowii*. Plant Pathology, 63, 838–845.

Wu LP, Liu HW, Bateman M, Liu Z and Li R, 2017. Molecular characterization of a novel luteovirus from peach identified by high-throughput sequencing. Archives of Virology, 162, 2903–2905.

Wu LP, Yang T, Liu HW, Postman J and Li R, 2018. Molecular characterization of a novel rhabdovirus infecting blackcurrant identified by high-throughput sequencing. Archives of Virology, 163, 1363–1366.

Xiang Y, Bernadry M, Bhagwat B, Wiersma PA, De Young R and Bouthillier M, 2015. The complete genome sequence of a new polerovirus in strawberry plants from eastern Canada showing strawberry decline symptoms. Archives of Virology, 160, 553–556.

Xu D, Mock R, Kinard G and Li R, 2011. Molecular analysis of the complete genomic sequencers of four isolates of Gooseberry vein banding associated virus. Virus Genes, 43, 130–137.

Yang HY, Liu ZJ, Luo S and Li LL, 2017. First report of apple stem pitting virus infecting Nanking cherry in China. Plant Disease, 101, 1067.

Abbreviations

CABI	Centre for Agriculture and Biosciences International
EPPO	European and Mediterranean Plant Protection Organization
FAO	Food and Agriculture Organization
HTS	high-throughput sequencing
ICTV	International Committee on Taxonomy of Viruses
IPPC	International Plant Protection Convention
MS	Member State
PLH	EFSA Panel on Plant Health
TFEU	Treaty on the Functioning of the European Union
ToR	Terms of Reference

Appendix A – Viruses and viroids of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. considered as non-EU

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering non-EU	Uncertainties	References[#]
Actinidia virus X	AVX		X							Not reported to be present in the EU	Virus characterised in 2015, present in New Zealand. It might be present but not reported in the EU	Blouin et al. (2013); James and Phelan (2016)
Alaska vitivirus	AlV		X							Not reported to be present in the EU	The virus was reported only once (2012) and it is poorly characterised. It might be present but not reported in the EU	Robertson et al. (2012)
American plum line pattern virus	APLPV							X		Virus reported from several countries outside the EU and only from Italy in the EU	Limited uncertainties. It might be present but not reported in the EU. This virus has been addressed in the previous EFSA opinion (EFSA PLH Panel, 2013a)	
Apple fruit crinkle viroid	AFCVd				X					Not reported to be present in the EU	Limited uncertainties. It might be present but not reported in the EU. This virus has been addressed in the previous EFSA opinion (EFSA PLH Panel, 2013a)	Di Serio et al. (2017)
Apple geminivirus*	AGV				X					Not reported to be present in the EU	Recently described virus (2015) from HTS data on which very limited information is available. It might be present but not reported in the EU	Liang et al. (2015)
Apple green crinkle-associated virus	AGCaV				X		X			Virus reported from non EU countries (Canada, Australia, New Zealand), with the exception of reports in Italy and Spain	Limited uncertainty. It might be present but not reported in more EU MSs	Morelli et al. (2017); James et al. (2013)
Apple latent spherical virus	ALSV				X					Not reported to be present in the EU	Virus described in 2000 on which information is very limited. It might be present but not reported in the EU. This virus has been addressed in the previous EFSA opinion (EFSA PLH Panel, 2013a)	Koganezawa and Ito (2011)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering non-EU	Uncertainties	References[#]
Apple necrotic mosaic virus*	ApNMV				X					Not reported to be present in the EU	Recently described virus (2017) from HTS data for which very limited data is available. It might be present but not reported in the EU	Noda et al. (2017)
Apple-associated luteovirus*	AaLV				X					Not reported to be present in the EU	Recently described virus (2018) from HTS data on which very limited information is available. It might be present but not reported in the EU	Shen et al. (2018)
Asian prunus virus 1	APV-1							X		Not reported to be present in the EU	Limited uncertainties. It might be present but not reported in the EU. This virus has been addressed in the previous EFSA opinion (EFSA PLH Panel, 2013a)	Marais et al. (2006)
Asian prunus virus 2	APV-2							X		Not reported to be present in the EU	Limited uncertainties. It might be present but not reported in the EU. This virus has been addressed in the previous EFSA opinion (EFSA PLH Panel, 2013a)	Marais et al. (2006)
Asian prunus virus 3	APV-3							X		Not reported to be present in the EU	Not recognised by ICTV as a valid species. Might be synonymous with Asian prunus virus 2. It might be present but not reported in the EU. This virus has been addressed in the previous EFSA opinion (EFSA PLH Panel, 2013a)	Marais et al. (2006)
Australian grapevine viroid	AGVd								X	Only one report in Italy	It might be more widely present but not reported in the EU	Gambino et al. (2014)
Black raspberry cryptic virus	BRCV	X								Not reported to be present in the EU	Poorly characterised virus for which only partial sequence is available. It might be present but not reported in the EU	Sabanadzovic (2009)
Blackberry calico virus	BCV	X								Not reported to be present in the EU	Virus not characterised at molecular level, with no sequence data. Only reported from Canada. It might be present but not reported in the EU	Martin et al. (2013)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering non-EU	Uncertainties	References[#]
Blackberry leaf mottle-associated virus*	BLMaV	X								Not reported to be present in the EU	Recently described virus (2017) from HTS data on which very limited is available. It might be present but not reported in the EU	Hassan et al. (2017)
Blackberry vein banding-associated virus	BVBaV	X								Not reported to be present in the EU	Recently described virus (2013) on which information is very limited. It might be present but not reported in the EU	Thekke-Veetil et al. (2013)
Blackberry virus E	BVE	X								Not reported to be present in the EU	Recently described virus (2011) on which information is very limited. It might be present but not reported in the EU	Martin et al. (2013)
Blackberry virus F	BVF	X								Not reported to be present in the EU	Recently described virus (2017) on which information is very limited. It might be present but not reported in the EU	Shahid et al. (2017)
Blackberry virus S	BlVS	X							X[2]	Not reported to be present in the EU	Virus characterised in 2009, in wild germplasm in the US. It might be present but not reported in the EU	Martin et al. (2013); Dolja et al. (2017)
Blackberry virus X	BVX	X								Not reported to be present in the EU	Virus characterised in 2008, present in the US. It might be present but not reported in the EU	Tzanetakis et al. (2008b)
Blackberry virus Y	BlVY	X								Not reported to be present in the EU	Recently described virus (2008) on which information is very limited. It might be present but not reported in the EU	Martin et al. (2013)
Blackberry virus Z	BVZ	X								Not reported to be present in the EU	Virus characterised in 2008, present in the US. It might be present but not reported in the EU	Tzanetakis et al. (2008b)
Blackberry yellow vein-associated virus	BYVaV	X								Not reported to be present in the EU	Virus described in 2004 on which information is limited. It might be present but not reported in the EU	Martin et al. (2013)
Blackcurrant leaf chlorosis virus*	BCLCaV		X							Not reported to be present in the EU	Virus characterised in 2017 from HTS for which very limited data is available. It might be present but not reported in the EU	James and Phelan (2017); Thekke-Veetil et al. (2017)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering non-EU	Uncertainties	References[#]
Blackcurrant-associated rhabdovirus*	BCaRV		X							Not reported to be present in the EU	Recently described virus (2017) from HTS data and on which very limited information is available. It might be present but not reported in the EU	Wu et al. (2018)
Blueberry leaf mottle virus	BLMoV								X	Not reported to be present in the EU	Virus characterised in 1979, in wild germplasm in the US. It might be present but not reported in the EU	
Caucasus prunus virus*	CPrV							X		Reported from Azerbaijan. Reported in France from a germplasm collection	Very recently described virus from HTS data (2015). Significant uncertainty. It might be present but not reported in other EU MSs or outside the EU	Marais et al. (2015a)
Cherry rasp leaf virus	CRLV	X			X			X		Not reported to be present in the EU	Limited uncertainties. It might be present but not reported in the EU. This virus has been addressed in the previous EFSA opinion (EFSA PLH Panel, 2013a)	James (2011b)
Cherry rosette virus	CRV							X		Only reported from Switzerland. Not reported to be present in the EU	Poorly characterised virus only mentioned in few publications. It might be present but not reported in the EU	Martelli and Uyemoto (2011)
Cherry rusty mottle associated virus	CRMaV							X		Not reported to be present in the EU	It might be present but not reported in the EU	Villamor et al. (2013)
Cherry twisted leaf associated virus	CTLaV							X		Reported from North America. EU reports are old and only based on symptomatology	Significant uncertainties. The sequence and efficient diagnostics only recently became available with the HTS characterisation of the virus (James et al., 2014). It might be more widely present in the EU. Virus previously addressed in an EFSA opinion (EFSA PLH Panel, 2013a)	James (2011c)
Cherry virus B*	CVB							X		Not reported to be present in the EU	Extremely limited information on this virus only reported in GenBank as a complete genome sequence obtained by HTS in Japan. It might be present but not reported in the EU	

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering non-EU	Uncertainties	References[#]
Fragaria chiloensis cryptic virus	FCCV			X						Not reported to be present in the EU	Virus described in 2005 on which information is limited. It might be present but not reported in the EU	Tzanetakis and Martin (2005b); Tzanetakis et al. (2008a)
Fragaria chiloensis latent virus	FCiLV			X						Not reported to be present in the EU	Virus described in 2005 on which information is limited. It might be present but not reported in the EU	Tzanetakis and Martin (2005a)
Grapevine Ajinashika virus	GAgV								X	Not reported to be present in the EU	Not recognised by ICTV as a valid species. Virus very poorly characterised in 1990 on which no sequence data is available. It might be present but not reported in the EU	Martelli (2014)
Grapevine Anatolian ringspot virus	GARSV								X	Not reported to be present in the EU	It might be present but not reported in the EU	Martelli (2014)
Grapevine berry inner necrosis virus	GINV								X	Not reported to be present in the EU	It might be present but not reported in the EU	Martelli et al. (2017)
Grapevine cryptic virus 1	GCV-1=GPV-1								X	Not reported to be present in the EU	Virus very poorly characterised only mentioned in two conference abstracts (2009, 2012). It might be similar to grapevine cryptic virus. It belongs to *Partitiviridae* family, which contains agents infecting plants or fungi. Status as a grapevine-infecting virus unclear. It might be present but not reported in the EU	Sabanadzovic (2009); Martelli (2014); Martelli et al. (2017)
Grapevine deformation virus	GDeV								X	Not reported to be present in the EU	It might be present but not reported in the EU	Digiaro et al. (2017)
Grapevine endophyte endornavirus*	GEEV								X	Not reported to be present in the EU	Virus described in 2012 by HTS. It belongs to *Endornavirus* genus, which contains agents infecting plants or fungi. Status as a *Vitis*-infecting virus is unclear. It might be present but not reported in the EU	Espach et al. (2012)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering non-EU	Uncertainties	References[#]
Grapevine fabavirus*	GFabV								X	Not reported to be present in the EU	Recently described virus (2016) from HTS data on which very limited is available. It might be present but not reported in the EU	Al Rwahnih et al. (2016)
Grapevine geminivirus A*	GGVA								X	Not reported to be present in the EU	Recently described virus (2017) from HTS data on which very limited is available. It might be present but not reported in the EU	Al Rwahnih et al. (2017a,b)
Grapevine leafroll-associated virus 13	GLRaV-13								X	Not reported to be present in the EU	Recently described virus (2016) from HTS data on which information is very limited. It might be present but not reported in the EU	Ito and Nakaune (2016)
Grapevine red blotch virus	GRBV	X							X	Not reported to be present in the EU	It might be present but not reported in the EU	Cieniewicz et al. (2017); Bahder et al. (2016); Krenz et al. (2012); Poojari et al. (2013)
Grapevine stunt virus	GSV								X	Not reported to be present in the EU	Not recognised by ICTV as a valid species. Virus reported in Japan in 1981, very poorly characterised, its precise identity is not known and no sequence data is available. It might be present but not reported in the EU	Plant viruses Online: http://sdb.im.ac.cn/vide/descr374.htm; Namba et al. (1981)
Grapevine Tunisian ringspot virus	GTRV								X	Not reported to be present in the EU	Virus partially characterised, isolated in 1992, no sequences available in GenBank. It might be present but not reported in the EU	Digiaro et al. (2017)
Grapevine vein-clearing virus	GVCV								X	Not reported to be present in the EU	Recently described virus (2011) from HTS data on which information is limited. It might be present but not reported in the EU	Martelli (2017)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering non-EU	Uncertainties	References[#]
Grapevine virus 101-14.N.23.9.1/ South Africa/ 2009	GV-101-14								X	Not reported to be present in the EU	Extremely limited information on this virus, only reported in GenBank as a partial genome sequence (2016) in South Africa. It might be present but not reported in the EU	
Grapevine virus I*	GVI								X	Not reported to be present in the EU	Recently described virus (2018) from HTS data on which information is limited. It might be present but not reported in the EU	Blouin et al. (2018a)
Grapevine virus J*	GVJ								X	Not reported to be present in the EU	Recently described virus (2018) by HTS in Turkmenistan. Very limited information available. It might be present but not reported in the EU	
Grapevine virus S*	GVS								X	Not reported to be present in the EU	Extremely limited information on this virus, only reported in GenBank as a partial genome sequence obtained by HTS (2012) in Canada. It might be present but not reported in the EU	
Grapevine yellow speckle viroid 2	GYSVd-2								X	Only one report in Italy in two varieties	It might be more widely present but not reported in the EU	Gambino et al. (2014)
Ilarvirus S1* (possible Ilarvirus)	Ilarvirus-S1							X		Not reported to be present in the EU	Characterisation of this potential new virus from Australia is very limited (very partial sequence information available from HTS data, 2017). It might be present but not reported in the EU	Kinoti et al. (2017)
Ilarvirus S2* (possible Ilarvirus)	Ilarvirus-S2							X		Not reported to be present in the EU	Characterisation of this potential new virus from Australia is very limited (very partial sequence information available from HTS data, 2017). It might be present but not reported in the EU	Kinoti et al. (2017)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering non-EU	Uncertainties	References[#]
Nectarine virus M*	NeVM							X		Not reported to be present in the EU	Recently described virus (2016) from HTS data on which very limited information is available. It might be present but not reported in the EU	Villamor et al. (2016)
Peach chlorotic mottle virus	PeCMV							X		Not reported to be present in the EU	It might be present but not reported in the EU	James et al. (2007)
Peach enation (?) nepovirus	PENV							X		Not reported to be present in the EU	Virus very poorly characterised, only mentioned in one 1973 abstract. Its precise identity cannot be ascertained. It might be present but not reported in the EU	Kishi et al. (1973)
Peach leaf pitting-associated virus*	PLPaV							X		Not reported to be present in the EU	Recently described virus (2017) from HTS data on which very limited is available. It might be present but not reported in the EU	He et al. (2017)
Peach mosaic virus	PcMV							X		Virus reported only from two EU MSs, and these reports have never been confirmed molecularly	Limited uncertainty. It might be present but not reported in other EU MSs or outside the EU. This virus has been addressed in the previous EFSA opinion (EFSA PLH Panel, 2013a)	Larsen and James (2011)
Peach rosette mosaic virus	PRMV							X	X	Not reported to be present in the EU	Limited uncertainties. It might be present but not reported in the EU. This virus has been addressed in the previous EFSA opinion (EFSA PLH Panel, 2013a)	Martelli and Uyemoto (2011); Martelli (2014); Ramsdell and Gillet (1998)
Peach virus D*	PeVD							X		Not reported to be present in the EU	Recently described virus (2017) from HTS data on which very limited information is available. It might be present but not reported in the EU	Igori et al., 2017;
Pyrus pyrifolia cryptic virus*	PpCV					X				Not reported to be present in the EU	Recently described virus (2017) from HTS data. It belongs to *Partitiviridae* family, which contains agents infecting plants or fungi. Status as a pear-infecting virus unclear. It might be present but not reported in the EU	Osaki et al. (2017)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering non-EU	Uncertainties	References[#]
Pyrus pyrifolia partitivirus 2*	PpPV-2					X				Not reported to be present in the EU	Recently described virus (2018) from HTS data. It belongs to *Alphapartitivirus* genus, which contains agents infecting plants or fungi. Status as a pear-infecting virus unclear. It might be present but not reported in the EU	Osaki and Sasaki (2018)
Raspberry latent virus	RpLV	X								Not reported to be present in the EU	It might be present but not reported in the EU	Martin et al. (2013)
Raspberry leaf curl virus	RpLCV	X								Not reported to be present in the EU	Virus not molecularly characterised. It might be present but not reported in the EU	
Ribes virus F	RVF		X							Not reported to be present in the EU	Very poorly characterised virus for which only partial sequence is available. It might be present but not reported in the EU	
Rubus canadensis virus 1	RuCV-1	X								Not reported to be present in the EU	Virus characterised in 2014 for which very limited information is available. It might be present but not reported in the EU	Abou Ghanem-Sabanadzovic et al. (2013)
Strawberry chlorotic fleck-associated virus	StCFV			X						Not reported to be present in the EU	It might be present but not reported in the EU	Martin and Tzanetakis (2006)
Strawberry crinivirus 3	SCrV-3			X						Not reported to be present in the EU	Virus very poorly characterised, only two partial sequences from USA and China in GenBank. It might be present but not reported in the EU	Tzanetakis and Martin (2013)
Strawberry crinivirus 4	SCrV-4			X						Not reported to be present in the EU	Virus very poorly characterised, only four partial sequences from USA, Canada and China in GenBank. It might be present but not reported in the EU	Tzanetakis and Martin (2013); Ding et al. (2016)
Strawberry latent C virus	STLCV			X						Not reported to be present in the EU. Addressed by EFSA in a 2014 opinion, precise biological status unclear	SLCV has not been characterised, it is not recognised as a valid species, and reliable detection assays are not available (EFSA PLH Panel, 2014a)	

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering non-EU	Uncertainties	References[#]
Strawberry latent virus	StLV			X						Not reported to be present in the EU	Virus very poorly characterised only mentioned in one conference abstract (2005). It might be present but not reported in the EU	Martin and Tzanetakis (2006)
Strawberry leaf curl virus	StLCV			X						Not reported to be present in the EU	Limited information on this relatively recently described virus (2008). It might be present but not reported in EU	Tzanetakis and Martin (2013); El-gaied et al. (2008)
Strawberry necrotic shock virus	SNSV	X		X						Not reported to be present in the EU	It might be present but not reported in the EU	
Strawberry pallidosis associated virus	SPaV			X						Not reported to be present in the EU	It might be present but not reported in the EU	Tzanetakis et al. (2001)
Strawberry polerovirus 1	SPV-1			X						Not reported to be present in the EU	Virus characterised in 2015, present in Canada and the US. It might be present but not reported in the EU	Thekke-Veetil and Tzanetakis (2016); Xiang et al. (2015)
Strawberry pseudo mild yellow edge virus	SPMYEV			X						Not reported to be present in the EU	Virus described in 2003 on which information is very limited. It might be present but not reported in the EU	Martin and Tzanetakis (2006)
Summer grape enamovirus	SGEV								X	Not reported to be present in the EU	It might be present but not reported in the EU	Martelli (2017), Fagundes Silva et al. (2017)
Summer grape latent virus	SGLV								X	Not reported to be present in the EU	Not yet recognised by ICTV as a valid species. Virus described in 2009, on which full sequence data is available. It might be present but not reported in the EU	Martelli et al. (2017), Al Rwahnih et al. (2015)
Temperate fruit decay-associated virus	TFDaV				X	X			X	Not reported to be present in the EU	Recently described virus (2015) from HTS data on which very limited information is available. It might be present but not reported in the EU	Basso et al. (2015)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering non-EU	Uncertainties	References[#]
Tobacco ringspot virus	TRSV	X			X			X	X	TRSV is a North American nepovirus transmitted by North American nematode species. Reports in the EU are associated with intercepted material or are restricted and generally under official control. In some MSs eradication is ongoing or has been achieved	Limited uncertainty. It might be present but not reported in other EU MSs or outside the EU. This virus has been addressed in the previous EFSA opinion (EFSA PLH Panel, 2013a)	EPPO Bulletin (2017)
Tomato ringspot virus	ToRSV	X	X	X	X		X	X	X	ToRSV is a North American nepovirus transmitted by North American nematode species. Reports in the EU are associated with intercepted material or are restricted and generally under official control. In some MSs eradication is ongoing or has been achieved	Limited uncertainty. It might be present but not reported in other EU MSs or outside the EU. This virus has been addressed in the previous EFSA opinion (EFSA PLH Panel, 2013a)	
Tulare apple mosaic virus	TAMV				X					Not reported to be present in the EU	Found only once in nature, in an apple tree in Tulare County, California. Limited chances that it might exist in EU	AAB descriptions of plant viruses, N42: http://www.dpvweb.net/dpv/showdpv.php?dpvno=42
Wild vitis virus 1	WVV-1								X	Not reported to be present in the EU	Virus described very recently (2018) for which very limited information is available. It might be present but not reported in the EU	Perry et al. (2018)
Wineberry latent virus	WLV	X								Only report in the EU is in the UK from imported material from the US	Poorly characterised virus. It might be present but not reported in other EU MSs or outside the EU	Jones (1977)

MS: Member State; HTS: high-throughput sequencing; ICTV: International Committee on Taxonomy of Viruses.
[1]According to ICTV rules (https://talk.ictvonline.org/information/w/faq/386/how-to-write-a-virus-name), names of viruses are not italicised in the table.
[2]Mentioned in a table in Dolja et al. (2017) but not associated with any reference.
[#]: References are quoted when they are considered to contain additional information with respect to EPPO or CABI databases and/or GenBank, when available.
When no additional references are provided in this table, the information is retrieved from EPPO, CABI and GenBank databases, as indicated in the supplementary table in Annex A.
*: Virus identified by HTS.

Appendix B – Viruses and viroids of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. excluded from further categorisation

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as excluded from further categorisation	Uncertainties	References[#]
Alfalfa mosaic virus	AMV								X	This virus is rare in grapevine but widespread in EU MSs in other hosts, in particular alfalfa	Limited uncertainties. It might be more widely present in the EU	Martelli (2014)
Apple chlorotic leaf spot virus	ACLSV	X			X	X	X	X	X	This virus is widespread in EU MSs	Limited uncertainties. It might be more widely present in the EU	
Apple dimple fruit viroid	ADFVd				X					Reported in Italy from several varieties including old local ones.	It might be more widely distributed but not reported in the EU	Di Serio et al. (2017)
Apple mosaic virus	ApMV	X	X	X	X	X		X		This virus is reported in many EU MSs	Limited uncertainties. It might be more widely present in the EU	
Apple stem grooving virus	ASGV	X			X	X	X	X		Very widespread virus, likely present in apple in all EU MSs	Limited uncertainties. It might be more widely present in the EU	Nickel and Fajardo (2014); Negi et al. (2010)
Apple stem pitting virus	ASPV				X	X	X	X	X	Very widespread virus, likely present in apple in all EU MSs	Limited uncertainties. It might be more widely present in the EU	Jelkmann and Paunovic (2011); Yang et al. (2017)
Apricot latent ringspot virus	ALRSV							X		Only reported from France	It might be present but not reported in other EU MSs or outside the EU	Gentit et al. (2001)
Apricot latent virus	ApLV							X		Virus reported from several EU MSs and from some EU neighbouring countries (Moldova, Turkey, Palestine…)	Limited uncertainty. It might be present but not reported outside the EU	Nemchinov et al. (2011); Grimova and Rysanek (2012); Garcia-Ibarra et al. (2010)
Apricot pseudo-chlorotic leaf spot virus	APCLSV							X		Reported from six EU MSs, limited reports from outside the EU	Limited uncertainty. It might be present but not reported in other EU MSs or outside the EU	Candresse et al. (2011a)
Arabis mosaic virus	ArMV	X	X	X				X	X	This virus is reported in many EU MSs and integrated in the EU Grapevine Certification system	Limited uncertainties. It might be more widely present in the EU. Virus previously addresses in an EFSA opinion (EFSA PLH Panel, 2013b)	
Artichoke Italian latent virus	AILV								X	Only reported from 2 EU MSs	It might be present but not reported in other EU MSs or outside the EU	Martelli (2014)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as excluded from further categorisation	Uncertainties	References[#]
Bean common mosaic virus (BCMV)	BCMV								X	Known to widely occur in bean in EU	One abstract (2009) reporting BCMV infection in grapevine. BCMV is a common bean-infecting virus present in EU, its prevalence in grapevine is not known. It might be present but not reported in grapevine in the EU	Sabanadzovic, 2009
Beet pseudo yellows virus	BPYV	X		X						Virus reported from many EU MSs, likely to be rare in the hosts addressed here	Limited uncertainties. It might be more widely present in the EU	Martin et al. (2013)
Black raspberry necrosis virus	BRNV	X								Reported in 8 EU MSs	Limited uncertainties. It might be more widely present in the EU	Martin et al. (2013)
Blackcurrant reversion virus	BRV		X							Virus is present in many EU MSs	Limited uncertainties. It might be more widely present in the EU	
Broad bean wilt virus 1	BBWV-1								X	This virus is reported in many EU MSs in other hosts than grapevine	Limited uncertainties. It might be more widely present in the EU	Castrovilli et al. (1985)
Carnation Italian ringspot virus	CIRV							X		Reported from several EU MSs and from Korea	It might be present but not reported in other EU MSs or outside the EU	Jelkmann (2011); Russo et al. (2008); Lesemann et al. (1989)
Carnation mottle virus	CarMV								X	This virus is reported in many EU MSs, uncertainty because of one reference	Limited uncertainties. It might be more widely present in the EU	Avgelis and Rumbos (1991)
Carnation ringspot virus	CRSV				X	X		X	X	Virus rare in the hosts addressed here but that has a wider host range. Virus reported from many EU MSs	Limited uncertainties. It might be more widely present in the EU	
Cherry green ring mottle virus	CGRMV							X		Virus present in many EU MSs	Limited uncertainties. It might be more widely present in the EU	Gentit et al. (2002); Spak et al. (2017); Komorowska and Cieslinska (2005)
Cherry leaf roll virus	CLRV	X	X		X			X	X	This virus is reported in many EU MSs	Limited uncertainties. It might be more widely present in the EU. Virus previously addressed in an EFSA opinion (EFSA PLH Panel, 2014f)	Büttner et al. (2011); Woo and Pearson (2014)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as excluded from further categorisation	Uncertainties	References[#]
Cherry necrotic rusty mottle virus	CNRMV				X			X		Reported from a number of EU MSs	Lots of reports are based on biological indexing of unknown specificity and may no longer be current. It might be present but not reported in other EU MSs or outside the EU	Rott and Jelkmann (2011)
Cherry virus A	CVA							X		Virus reported from many EU MSs	Limited uncertainties. It might be more widely present in the EU	Marais et al. (2011); Glasa et al. (2017); Safarova et al. (2013); Kirby et al. (2001)
Cherry-associated luteovirus*	ChaLV							X		Only reported from the Czech Republic	Very recently described virus from HTS data (Lenz et al., 2017). Limited uncertainty. It might be present but not reported in other EU MSs or outside the EU	Lenz et al. (2017)
Citrus exocortis viroid	CEVd								X	This viroid is rare in grapevine but frequently present in non-certified citrus plants. It is reported from 11 EU MSs	Limited uncertainties. It might be more widely present in the EU. Virus previously addressed in an EFSA opinion (EFSA PLH Panel, 2011)	Flores et al. (1985)
Cucumber mosaic virus	CMV		X	X	X	X		X	X	Although rare in the hosts addressed here, this virus has one of the widest known host ranges and is widespread in herbaceous hosts, in particular cucurbits and *Solanaceae* in the EU	Limited uncertainties. It might be more widely present in the EU	Hu et al. (2016b); Chen et al. (2014); Sliwa et al. (2008); Paradies et al. (2000)
Currant latent virus*	CLV		X							Recently described virus from HTS data (Petrzik et al., 2016a). Only reported from the Czech Republic so far	Limited uncertainty. It might be present but not reported outside the EU	Petrzik et al. (2016a)
Currant virus A*	CuVA		X							Recently described virus from HTS data (Petrzik et al., 2016b). Only reported from the Czech Republic so far	Limited uncertainty. It might be present but not reported outside the EU	Petrzik et al. (2016b)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as excluded from further categorisation	Uncertainties	References[#]
Epirus cherry virus	EpCV							X		Reported only from 2 MSs	Limited uncertainty. It might be present but not reported in other EU MSs or outside the EU	Avgelis and Barba (2011)
Gooseberry vein banding associated virus	GVBaV		X							Reported from 4 EU MSs and from Canada outside the EU	Limited uncertainty	Petrzik et al. (2012); Cieślińska and Malinowski (2002); Jones et al. (2001); Xu et al. (2011)
Grapevine Algerian latent virus	GALV								X	Reported from surface waters in three EU MSs and from several non-EU countries, in general from solanaceous hosts	Virus reported only once from grapevine. Significant uncertainties on its distribution both inside and outside the EU	Martelli (2014)
Grapevine angular mosaic virus	GAMoV								X	Virus reported only from Greece	Limited uncertainty, virus might be present but not reported in other EU MSs or outside the EU	Martelli et al. (2017)
Grapevine asteroid mosaic-associated virus	GAMaV								X	Reported from Italy, France and Hungary and from the USA outside the EU	Virus described in Italy in 1994 that has been largely overlooked until the development of HTS in grapevine. Limited uncertainty, virus might be present but not reported in other EU MSs or outside the EU	Candresse et al. (2017b); Czotter et al. (2018); Sabanadzovic et al. (2017)
Grapevine badnavirus 1*	GBV-1								X	Only reported from Croatia	Very recently described virus from HTS data (Voncina and Almeida, 2018). Significant uncertainty. It might be present but not reported in other EU MSs or outside the EU	Voncina and Almeida (2018)
Grapevine Bulgarian latent virus	GBLV								X	Only reported from 3 EU MSs and former Yugoslavia	It might be present but not reported in other EU MSs or outside the EU	Martelli (2014)
Grapevine chrome mosaic virus	GCMV								X	Only reported from 3 EU MSs and former Yugoslavia	It might be present but not reported in other EU MSs or outside the EU	Digiaro et al. (2017)
Grapevine fanleaf virus	GFLV	X							X	This virus is reported in many EU MSs and integrated in the EU Grapevine Certification system	Limited uncertainties. It might be more widely present in the EU	Kargar et al. (2017)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as excluded from further categorisation	Uncertainties	References[#]
Grapevine fleck virus	GFkV								X	This virus is reported in many EU MSs and integrated in the EU Grapevine rootstocks Certification system	Limited uncertainties. It might be more widely present in the EU	Czotter et al. (2018); Eichmeier et al. (2016); Immanuel et al. (2015); Sabanadzovic et al. (2017)
Grapevine hammerhead viroid-like RNA*	GHVd								X	Reported from Hungary and USA in material originally from France or Italy. Reported from France and recently identified in Italy. No reports from outside the EU in material without a link to the EU.	Very recently described agent (2012) for which there is very little information on distribution. It might be present but not reported outside the EU and in more EU MSs	Candresse et al. (2017a)
Grapevine labile rod-shaped virus	GLRSV								X	Only reported from Italy	Poorly characterised virus. It might be present but not reported in other EU MSs or outside the EU	Faggioli et al. (1992)
Grapevine latent viroid*	GLVd								X	Present in many EU MSs	Limited uncertainties. It might be more widely present in the EU	Rotunno et al. (2018)
Grapevine leafroll-associated virus 1	GLRaV-1								X	This virus is reported in many EU MSs and integrated in the EU Grapevine Certification system	Limited uncertainties. It might be more widely present in the EU	Martelli (2014); Voncina et al. (2017); Komorowska et al. (2014); Le Maguet et al. (2013); Kominek et al. (2005)
Grapevine leafroll-associated virus 2	GLRaV-2								X	This virus is reported in publications in a few EU MSs but its EU distribution is wider according to expert knowledge	Limited uncertainties. It might be more widely present in the EU	Voncina et al. (2017); Komorowska et al. (2014); Angelini et al. (2017); Cseh et al. (2012)
Grapevine leafroll-associated virus 3	GLRaV-3								X	This virus is reported in many EU MSs and integrated in the EU Grapevine Certification system	Limited uncertainties. It might be more widely present in the EU	Voncina et al. (2017); Komorowska et al. (2014); Cseh et al. (2012); Gouveia et al. (2011); Maree et al. (2013)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as excluded from further categorisation	Uncertainties	References[#]
Grapevine leafroll-associated virus 4	GLRaV-4								X	This virus is reported in publications in 5 EU MSs and its EU distribution is wider according to expert knowledge	Limited uncertainties. It might be more widely present in the EU	Voncina et al. (2017); Padilla et al. (2013); Velasco et al. (2015); Esteves et al. (2012); Cseh et al. (2012); Rizzo et al. (2015); Martelli et al. (2012); Abou Ghanem-Sabanadzovic et al. (2017)
Grapevine line pattern virus	GLPV								X	Virus reported only from Hungary	Poorly characterised virus for which no sequence information is available. Limited uncertainty. It might be present but not reported in other EU MSs or outside the EU	Martelli (2014)
Grapevine Pinot gris virus*	GPGV								X	This virus is present in many EU MSs	Limited uncertainties. It might be more widely present in the EU	Saldarelli et al. (2017)
Grapevine red globe virus	GRGV								X	Reported from several EU MSs (Italy, France, Spain, Hungary, Greece), also known to be present in Portugal (expert Knowledge). Limited known distribution outside the EU	Virus described in Italy in 2000 that has been largely overlooked until the development of HTS in grapevine. Limited uncertainty, virus might be present but not reported in other EU MSs or outside the EU	Czotter et al. (2018); Sabanadzovic et al. (2017)
Grapevine Roditis leaf discoloration-associated virus*	GRLDaV								X	Virus only reported so far from two EU MSs and from Turkey (GenBank)	Limited uncertainty. It might be more widely present than currently known outside the EU	Martelli et al. (2017)
Grapevine rupestris stem pitting-associated virus	GRSPaV								X	Very widespread virus, likely present in grapevine in all EU MSs	Limited uncertainties. It might be more widely present in the EU	Czotter et al. (2018); Eichmeier et al. (2016); Fiore et al. (2016); Voncina et al. (2017); Giampetruzzi et al. (2012); Komorowska et al. (2014); Beuve et al. (2013)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as excluded from further categorisation	Uncertainties	References[#]
Grapevine rupestris vein feathering virus	GRVFV								X	Virus is present in a number of EU MSs	Limited uncertainties. This virus is likely to have been overlooked for a long time in grapevine. It might be more widely present in the EU	Czotter et al. (2018); Giampetruzzi et al. (2012); Voncina et al. (2017); Cretazzo and Velasco (2017), Eichmeier et al. (2016)
Grapevine Syrah virus 1*	GSyV-1	X							X	Virus is present in 6 EU MSs	Limited uncertainties. This virus is likely to have been overlooked for a long time in grapevine. It might be more widely present in the EU	Giampetruzzi et al. (2012); Czotter et al. (2018); Eichmeier et al. (2016); Glasa et al. (2015); Ruiz-Garcia et al. (2017); Beuve et al. (2013); Martin et al. (2013)
Grapevine virus A	GVA								X	This virus is reported in many EU MSs	Limited uncertainties. It might be more widely present in the EU	Immanuel et al. (2015)
Grapevine virus B	GVB								X	This virus is reported in many EU MSs	Limited uncertainties. It might be more widely present in the EU	Martelli (2014); Komorowska et al. (2014); Voncina et al. (2017); Eichmeier et al. (2016)
Grapevine virus D	GVD								X	Reported from 2 EU MSs and present in additional MSs according to expert knowledge	Limited uncertainties. It might be more widely present in the EU	Martelli (2014); Voncina et al. (2017)
Grapevine virus F*	GVF								X	Reported from five EU MSs	Very recently described virus from HTS data (2012). Significant uncertainty. It might be present but not reported in other EU MSs or outside the EU	Al Rwahnih et al. (2014); Voncina et al. (2017)
Grapevine virus G*	GVG								X	Reported from Croatia and from New Zealand in material originally imported from France	Very recently described virus from HTS data (2018). Significant uncertainty. It might be present but not reported in other EU MSs or outside the EU	Blouin et al. (2018b)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as excluded from further categorisation	Uncertainties	References[#]
Grapevine virus H*	GVH								X	Only reported from Portugal	Very recently described virus from HTS data (2017). Significant uncertainty. It might be present but not reported in other EU MSs or outside the EU	Candresse et al. (2018)
Grapevine virus K*	GVK								X	Not a valid species it is being synonymised with GVD	See GVD	Jo et al. (2017a)
Grapevine virus T*	GVT								X	Virus reported from HTS data in Korea on a grapevine of Italian origin. Virus also reported in Germany and known by expert knowledge to be present in France	Limited uncertainty. It might be present but not reported outside the EU	Jo et al. (2017b); Ruiz Garcia et al. (2018)
Grapevine yellow speckle viroid 1	GYSVd-1								X	This viroid is likely present in many EU MSs	Limited uncertainties. It might be more widely present in the EU	Habili (2017)
Hop stunt viroid	HSVd			X	X	X	X	X	X	Present in many EU MSs, likely to present in most grapevine plants over the EU according to expert knowledge	Limited uncertainties. It might be more widely present in the EU	Kaponi et al. (2010)
Impatiens necrotic spot tospovirus	INSV	X								This virus is widespread in EU MSs	Limited uncertainties. It might be more widely present in the EU. Virus previously addressed in an EFSA opinion (EFSA PLH Panel, 2012)	
Iris yellow spot virus	IYSP	X								Virus is widespread in EU MSs in other hosts but likely to be rare in the hosts addressed here	Limited uncertainties. It might be more widely present in the EU. Virus previously addresses in an EFSA opinion (EFSA PLH Panel, 2012)	
Little cherry virus 1	LChV1							X		Reported from 11 EU MSs	It might be present but not reported in more EU MSs. Non-EU isolates addressed by EFSA in an opinion in 2017 (EFSA PLH Panel, 2017)	Jelkmann and Eastwell (2011)
Little cherry virus 2	LChV2							X		Reported from 7 EU MSs	It might be present but not reported in more EU MSs. Non-EU isolates addressed by EFSA in an opinion in 2017 (EFSA PLH Panel, 2017)	Jelkmann and Eastwell (2011)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as excluded from further categorisation	Uncertainties	References[#]
Myrobalan latent ringspot virus	MLRSV							X		Only reported from France.	It might be present but not reported in other EU MSs or outside the EU	Martelli and Uyemoto (2011)
Peach latent mosaic viroid	PLMVd				X	X	X	X	X	This viroid is present in many EU MSs	Limited uncertainties. It might be more widely present in the EU	Kyriakopoulou et al. (2017)
Peach-associated luteovirus*	PaLV							X		Reported in the US in material from Spain and from the Republic of Georgia. Also reported from Italy	Very recently described virus from HTS data (2017). Limited uncertainty. It might be present but not reported in other EU MSs or outside the EU	Wu et al. (2017)
Pear blister canker viroid	PBCVd				X	X	X			Present in 5 EU MSs	Limited uncertainties. It might be more widely present in the EU	Di Serio et al. (2017); Kaponi et al. (2010)
Petunia asteroid mosaic virus	PAMV				X	X		X		Only reported from two EU MSs	Limited uncertainty. It might be present but not reported in other EU MSs or outside the EU	Jelkmann (2011)
Plum bark necrosis stem pitting-associated virus	PBNSPaV			X				X		Virus likely to be under-reported. Reported from 3 EU MSs and from 3 non EU countries	Information on geographical distribution still very limited	Boscia et al. (2011); Abou Ghanem-Sabanadzovic et al. (2001); Amenduni et al. (2005); Garcia-Ibarra et al. (2010); Marais et al. (2014)
Plum pox virus	PPV							X		This virus is reported in many EU MSs	Limited uncertainties. It might be more widely present in the EU. Virus previously addressed in a Dutch opinion (2011) and in an EFSA opinion (EFSA PLH Panel, 2013a)	
Potato virus X	PVX								X	This virus has a worldwide distribution in potato, it is present in a number of EU MSs in this host	Limited uncertainty. Prevalence in grapevine is unknown but likely to be very low	Chabbouh et al. (1993)
Potato virus Y	PVY								X	This virus is widespread in EU MSs in many other hosts but unclear whether Grapevine is infected (Tannat isolate)	Limited uncertainties. It might be more widely present in the EU	

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as excluded from further categorisation	Uncertainties	References[#]
Prune dwarf virus	PDV							X		This virus is reported in many EU MSs and integrated in the EU Prunus Certification system	Limited uncertainties. It might be more widely present in the EU	Caglayan et al. (2011)
Prunus necrotic ringspot virus	PNRSV	X			X			X		This virus is reported in many EU MSs and integrated in the EU Prunus Certification system	Limited uncertainties. It might be more widely present in the EU. Virus previously addresses in an EFSA opinion (EFSA PLH Panel, 2014e)	Chandel et al. (2008); Hu et al. (2016a); Sharma et al. (1998)
Raspberry bushy dwarf virus	RBDV	X					X		X	Virus is widespread in many EU MSs	Limited uncertainties. It might be more widely present in the EU	Martin et al. (2013); Mavric et al. (2003); Mavric Pleško et al. (2009); Mavric Pleško et al. (2012); Martelli et al. (2011)
Raspberry leaf blotch emaravirus	RLBV	X								Virus reported so far only from the EU and Serbia and Montenegro	Limited uncertainty. It might be present but not reported outside the EU	Martin et al. (2013)
Raspberry leaf mottle virus	RLMV	X	X							Virus reported to be widespread in the UK. Also known to occur in the US	Limited uncertainty. It might be present but not reported outside the EU	Martin et al. (2013)
Raspberry ringspot virus	RpRSV	X	X	X				X	X	This virus is reported in many EU MSs	Limited uncertainties. It might be more widely present in the EU. Virus previously addresses in an EFSA opinion (EFSA PLH Panel, 2013b)	
Raspberry vein chlorosis virus	RVCV	X								Reported as widespread in the EU (Jones et al., 1974)	Limited uncertainties	Martin et al. (2013); Jones et al. (1974)
Rubus yellow net virus	RYNV	X								Virus reported from the UK, Canada and the US according to GenBank. It might be more widely spread	Cited as unconfirmed presence in the UK by CABI. Several references indicate widespread presence in *Rubus* worldwide. GenBank entries confirm presence in the UK. It might be more widely present but not reported in other EU MSs	Martin et al. (2013); Diaz-Lara et al. (2015)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as excluded from further categorisation	Uncertainties	References[#]
Sowbane mosaic virus	SoMV-R	X	X					X	X	Strain of sowbane virus reported from *Rubus* in Scotland only. Virus present in many EU MSs in other hosts	Limited uncertainties. It might be more widely present in the EU	McGavin and MacFarlane (2009); Besse et al. (2010)
Stocky prune virus	StPV							X		Virus only reported so far from France	Limited uncertainty. It might be present but not reported outside the EU	Candresse et al. (2011b)
Strawberry crinkle cytorhabdovirus	SCrV			X						Virus reported from many EU MSs	Limited uncertainties. It might be more widely present in the EU. Virus previously addresses in an EFSA opinion (EFSA PLH Panel, 2014c)	
Strawberry latent ringspot virus	SLRSV	X	X	X				X	X	This virus is widespread in EU MSs	Limited uncertainties. It might be more widely present in the EU. Virus previously addressed in an EFSA opinion (EFSA PLH Panel, 2013b)	
Strawberry mild yellow edge virus	SMYEV			X						Virus is present in many EU MSs	Limited uncertainties. It might be more widely present in the EU. Virus previously addresses in an EFSA opinion (EFSA PLH Panel, 2014d)	
Strawberry mottle virus	SMV			X						Reported in 9 EU MSs	Limited uncertainties. It might be more widely present in the EU	
Tobacco mosaic virus	TMV				X	X		X	X	Virus is widespread in EU MSs in solanaceous hosts but likely to be rare in the hosts addressed here	Limited uncertainties. It might be more widely present in the EU	Martelli (2017, 2014)
Tobacco necrosis virus	TNV			X	X	X		X	X	Virus with a wide host range, reported in many EU MSs	Limited uncertainties. It might be more widely present in the EU	
Tomato black ring virus	TBRV	X	X	X				X	X	This virus is reported in many EU MSs	Limited uncertainties. It might be more widely present in the EU. Virus previously addressed in an EFSA opinion (EFSA PLH Panel, 2013b)	
Tomato bushy stunt virus	TBSV				X	X		X		This virus is reported from a number of EU MSs and non-EU countries	Limited uncertainty. It might be present but not reported in other EU MSs or outside the EU	

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as excluded from further categorisation	Uncertainties	References[#]
Tomato mosaic virus	ToMV								X	Although rare in grapevine, this virus is widespread in tomato in EU	Limited uncertainties. It might be more widely present in the EU	Martelli (2017, 2014)
Tomato spotted wilt virus	TSWV								X	This virus has a wide host range and a worldwide distribution. It is present in a number of EU MSs in other hosts than grapevine	Limited uncertainty. Prevalence in grapevine is unknown but likely to be very low. This virus has been addressed in a previous EFSA opinion (EFSA PLH Panel, 2012)	
Turnip mosaic virus	TuMV							X		This virus is widespread in EU MSs in many other hosts but unclear whether grapevine is infected	Limited uncertainties. It might be more widely present in the EU	
Unidentified black currant Totiviridae			X							Only reported from the EU	Poorly characterised virus described only as partial sequence in a 2000 publication. Belongs to the *Totiviridae* family which contains agents infecting fungi. Status as a *Ribes*-infecting virus unclear. Only found once in a UK germplasm collection. It might be more widely present but not reported in the EU	Cox et al. (2000)

MS: Member State; HTS: high-throughput sequencing; ICTV: International Committee on Taxonomy of Viruses.
[1]According to ICTV rules (https://talk.ictvonline.org/information/w/faq/386/how-to-write-a-virus-name), names of viruses are not italicised in the table and in the present opinion.
[#]: References are quoted when they are considered to contain additional information with respect to EPPO or CABI databases and/or GenBank, when available. When no additional references are provided in this table, the information is retrieved from EPPO, CABI and GenBank databases, as indicated in the supplementary table in Annex A.
*: Virus identified by HTS.

Appendix C – Viruses and viroids of *Cydonia* Mill., *Fragaria* L., *Malus* Mill., *Prunus* L., *Pyrus* L., *Ribes* L., *Rubus* L. and *Vitis* L. with undetermined standing

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as uncertain non-EU/EU status	Uncertainties	References[#]
Apple hammerhead viroid RNA*	AHVd				X					Reported from China, Canada and recently found in Italy. Large uncertainties on distribution	Very recently described agent (2014) for which there is very little information on distribution	
Apple scar skin viroid	ASSVd				X	X		X		Reported to be present in wild and cultivated pear trees in Greece. Presence in EU MSs where it is reported appears to be very restricted or dubious	Prevalence in EU MSs where it is reported is not precisely known. This virus has been addressed in the previous EFSA opinion (EFSA PLH Panel, 2013a)	Hadidi and Barba (2011); Kyriakopoulou et al. (2001); Campbell and Sparks (1976); Hadidi et al. (2017a,b)
Apricot vein clearing-associated virus*	AVCaV							X		Reported from Italy. Reported in France from a germplasm collection or from imported material. Other reports are from non EU countries (Iran and China)	Very recently described virus from HTS data (2014). Significant uncertainty. It might be present but not reported in other EU MSs or outside the EU	Elbeaino et al. (2014); Marais et al. (2015a)
Blackberry chlorotic ringspot virus	BCRV	X			X					Virus reported from the UK, The USA and Korea according to GenBank entries	Information on distribution in and outside the EU very limited	Martin et al. (2013)
Blackcurrant leafroll associated virus 1	BcLRaV-1		X							Reported from the USA and Switzerland and recently found in Czech Republic and Slovenia. Large uncertainties on distribution	Very recently described agent (2010) for which there is very little information on distribution	Besse et al. (2010)
Cherry mottle leaf virus	CMLV							X		Reported in several EU MSs but records are doubtful	EU records predate CMLV molecular characterisation and are doubtful because they are largely based on disease observations and indexing approaches. Virus previously addresses in an EFSA opinion (EFSA PLH Panel, 2013a)	James (2011a)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as uncertain non-EU/EU status	Uncertainties	References[#]
Eggplant mottled crinkle virus	EMCV					X				Reported from one EU MS (from pear in Italy as pear latent virus). Reported from a range of countries outside the EU in eggplant (Lebanon, India, Iran, Morocco, Israel)	Significant uncertainties on its distribution both inside and outside the EU	Russo et al. (2002); Dombrovsky et al. (2009)
Grapevine leafroll-associated virus 7	GLRaV-7								X	Occasionally reported from Greece, Hungary and Italy. Reported from a number of countries outside the EU	It might be present but not reported in other EU MSs or outside the EU	Al Rwahnih et al. (2017a,b)
Grapevine satellite virus	GV-Sat								X	Reported in the US on material of European origin, in Hungary and in France on material of Iranian origin	Very recently described virus from HTS data (Al Rwahnih et al., 2013). Significant uncertainty. It might be present but not reported in other EU MSs or outside the EU	Czotter et al. (2018); Al Rwahnih et al. (2013)
Grapevine virus E	GVE								X	Reported only from two EU MSs and from several countries outside the EU	It might be present but not reported in other EU MSs or outside the EU	Martelli (2014); Komorowska et al. (2014); Voncina et al. (2017)
Nectarine stem pitting-associated virus*	NSPaV							X		Recently described agent, reported in a few Countries, both inside and outside the EU	Recently described virus (2015) from HTS data on which limited information is available. Initial US report is in post entry quarantine material from France. Reported in two EU MSs. It might be present but not reported in more EU MSs and outside the EU	Bag et al. (2015); Krizbai et al. (2017)
Prunus virus F*	PrVF							X		Reported from the US, Canada, the Czech Republic and in the US from *Prunus* accessions originating from the Netherlands and Germany	Recently described virus from HTS data (2016). Very limited information on its geographic distribution. It might be present but not reported in countries both outside and inside the EU	Villamor et al. (2017); Safarova et al. (2017)

VIRUS/VIROID name[1]	Abbreviation	*Rubus*	*Ribes*	*Fragaria*	*Malus*	*Pyrus*	*Cydonia*	*Prunus*	*Vitis*	Reasoning for considering as uncertain non-EU/EU status	Uncertainties	References[#]
Prunus virus T*	PrVT							X		Reported from Azerbaijan and Italy	Very recently described virus from HTS data (2015). Significant uncertainty. It might be present but not reported in other EU MSs or outside the EU	Marais et al. (2015b)
Strawberry vein banding virus	SVBV			X						Virus reported from a few EU MSs, at low prevalence. Also known to occur on cultivated strawberries in all five continents (EFSA PLH Panel, 2014b)	Addressed by EFSA in a 2014 opinion (EFSA PLH Panel, 2014b). Data for virus presence in many EU MS out of date or anecdotal due to the absence of recent systematic surveys. It might be present but not reported in more EU MSs	Hanzlikova-Vaskova et al. (2006); Ratti et al. (2009)

MS: Member State; HTS: high-throughput sequencing; ICTV: International Committee on Taxonomy of Viruses.
[1]According to ICTV rules (https://talk.ictvonline.org/information/w/faq/386/how-to-write-a-virus-name), names of viruses are not italicised.
[#]: References are quoted when they are considered to contain additional information with respect to EPPO or CABI databases and/or GenBank, when available.
When no additional references are provided in this table, the information is retrieved from EPPO, CABI and GenBank databases, as indicated in the supplementary table in Annex A.
*: Virus identified by HTS.

Annex A – List of viruses considered in the opinion

Annex A can be found in the online version of this output ('Supporting information' section): https://doi.org/10.2903/j.efsa.2019.5501