



A global database on the host plants of *Xylella* spp.

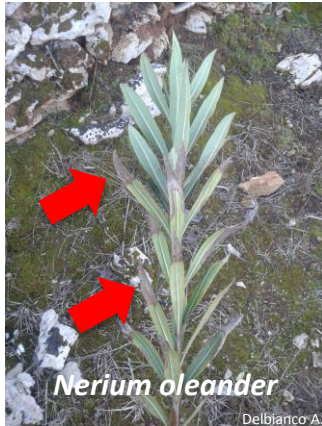
Alice Delbianco, Ewelina Czwieniczek,
Svetla Kozelska, Tomasz Kaluski, Andrea Baù,
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Sara Tramontini

European Food Safety Authority

Xylella fastidiosa outbreak in Italy



- 21 October 2013: the detection of *X. fastidiosa* in Lecce province was notified to the European Commission
- First confirmation of this pest under field conditions in the European Union
- The outbreak was characterised by leaf scorch and dieback of olive, oleander and almond trees



EFSA outputs on *Xylella fastidiosa* - 2013



- EFSA Working group :
R. Almeida
D. Bosco
C. Manceau

EFSA outputs on *Xylella fastidiosa* - 2013



EFSA Journal 2013;11(11):3468

STATEMENT OF EFSA

Statement of EFSA on host plants, entry and spread, pathways and risk

List of the University
of California Berkeley:

132 species



Xylella fastidiosa hosts, vectors, pathways and risk reduction

APPENDIX B. PLANT HOST STATUS FOR PIERCE'S DISEASE STRAINS OF *XYLELLA FASTIDIOSA*

(Available online: <http://www.cnr.berkeley.edu/xylella/control/hosts.htm>)

Scientific Name	Family	Common Name	Field Isolated ^b	GH Isolated ^c	Systemic ^d	Technique ^e	Vector Host ^f	Reference	Presence in Europe according to Flora Europaea ^g
<i>Acacia longifolia</i>	Leguminosae	golden wattle	Y			vector		Freitag (1951)	[?Ga Hs It Lu]
<i>Acer macrophyllum</i>	Aceraceae	big leaf maple	Y (medium)	Y (medium)	Y?	culture		Purcell and Saunders (1999)	
<i>Acer negundo</i>	Aceraceae	box elder		Y (low-med)		culture		Purcell and Saunders (1999)	[Au Bu Cz Ga Ge He Hs Hu Rs(C,W)]
<i>Aesculus californica</i>	Hippocastanaceae	California buckeye	Y (medium)	Y (low)		culture		Purcell and Saunders (1999)	

EFSA outputs on *Xylella fastidiosa* - 2014



EFSA Journal 2015;13(1):3989

SCIENTIFIC OPINION

**Scientific Opinion on the risk to plant health posed by
Xylella fastidiosa in the EU territory, with the identification
and evaluation of risk reduction options¹**

EFSA Panel on Plant Health (PLH)^{2,3}

European Food Safety Authority (EFSA), Parma, Italy

- 2015: first EFSA host plants database
- EFSA Working group:
R. Almeida, D. Bosco,
C. Bragard, D. Caffier,
J.C. Grégoire, S. Parnell



Xylella fastidiosa pest risk assessment

Appendix B. List of host plants of *Xylella fastidiosa* on the base of literature search

Abbreviations used in the Table below are given below for easier reference.

Notes:

*This is the new subspecies of *Xylella fastidiosa* described in 2014 by Nunney et al. (the precise nomenclature has not yet been confirmed).

E: experimental; H: host plant; L: location; MEIF: membrane entrapment immunofluorescence; NA: not available; P: phylogenetic studies; S: survey; SEM: scanning electron microscopy; TEM, transmission electron microscopy; ?: no information.

Plant family	Plant species	Plant common name	Country of detection/ experimentation	Location of detection/ experimentation	<i>X. fastidiosa</i> subspecies mentioned in the paper	<i>X. fastidiosa</i> putative subspecies	Justification for putative subspecies	Method by which infection determined	Detection protocol	Citation
Adoxaceae	<i>Sambucus</i> spp.	Elderberry	USA	Temecula, CA	NA	NA	P	S	ELISA	Costa et al., 2004

EFSA outputs on *Xylella fastidiosa* - 2015

SCIENTIFIC REPORT



APPROVED: 20 March 2015

PUBLISHED: 20 March 2015

doi:10.2903/j.efsa.2015.4061

Categorisation of plants for planting, excluding seeds, according to the risk of introduction of *Xylella fastidiosa*

European Food Safety Authority (EFSA)

312 species

PLANT_FAMILY	GENUS_Updated	PLANT_SPECIES_Updated	Common plant name	Country_of_detection/experimentation	INFECTION DETERMINED ("S"=survey/natural infection; "E"=experimentally)	Asymptomatic infection (YES=asymptomatic, NO=symptomatic, NA or empty cell=not clear or not reported)	Detection Methods (for legend please see section 2.2 EFSA Scientific Report on "Categorisation of plants for planting, excluding seeds, according to the risk of introduction of <i>Xylella fastidiosa</i> ")	CITATION
Adoxaceae	<i>Sambucus</i>	<i>cerulea</i>	Blue elder	USA	E	YES	PTV	Freitag J.H.(1951)
Adoxaceae	<i>Sambucus</i>	<i>cerulea</i>	Blue elder	USA	S	YES	PTV	Freitag J.H.(1951)
Adoxaceae	<i>Sambucus</i>	<i>nigra subsp. canadensis</i>	American elderberry	USA	E	NA	ITS CB	Baumgartner K. & Warren J.G. (2005)
Adoxaceae	<i>Sambucus</i>	<i>nigra subsp. canadensis</i>	American elderberry	USA	E	NA	ITS CB	Baumgartner K. & Warren J.G. (2005)
Adoxaceae	<i>Sambucus</i>	<i>nigra subsp. canadensis</i>	American elderberry	USA	E	NA	ELISA PCR_S_CB	Costa H.S. et al. (2004)

EFSA outputs on *Xylella fastidiosa* - 2016

SCIENTIFIC REPORT



APPROVED: 23 December 2015

PUBLISHED: 9 February 2016

doi:10.2903/j.efsa.2016.4378

**Update of a database of host plants
of *Xylella fastidiosa*: 20 November 2015**

European Food Safety Authority (EFSA)

359 species



Mandate from European Commission 2016-2020

Terms of reference

- Further specify and update the host plants database currently available...
- ... taking into account the different subspecies, strains and European isolates
- Inclusion of information on resistance and susceptibility
- Negative results of diagnostic tests
- Maintain and update regularly the database
- *EFSA Working group: R. Almeida, M. A. Jacques, J. Lopes, L. Nunney*

Resources & Methodologies

■ Extensive literature search:

Platform: ISI Web of Knowledge

Search string:

xylella OR xyllela OR xylela OR (pierce* NEAR/2 disease) OR ((Plum OR plums) AND "leaf scald*") OR (Phony NEAR/2 (peach* OR disease*)) OR (citrus AND variegat* AND chlorosis) OR crespers OR "almond leaf scorch" OR "bacterial leaf scorch" OR "coffee leaf scorch" OR "mulberry leaf scorch" OR "oleander leaf scorch" OR "sycamore leaf scorch" OR "Periwinkle wilt" OR "Ragweed stunt" OR (Olive NEAR "quick decline syndrome") OR "Xylem inhabiting bacteri*" OR "Xylem limited bacteri*" OR FXIB OR FXJB OR "rickettsialike bacteri*" OR "rickettsia like bacteri*"

Timespan: all years

Languages: all languages

EFSA (European Food Safety Authority), 2010. Application of systematic review methodology to food and feed safety assessments to support decision making. EFSA Journal 2010;8(6):1637, 90 pp. doi:10.2903/j.efsa.2010.1637.



Resources & Methodologies

3544 references

Resources & Methodologies

3544 references



3038 references

Resources & Methodologies

3544 references



3038 references



Upload in DistillerSR



Screening for relevance
is divided in 3 following steps:

Welcome to ALPHA_EFSA-Q-2016-00445_XYLELLA2017!

Alice.DELBIANCO, there are references assigned to you. Please click "Unreviewed" below to start reviewing.



Ti ab screening - Title/abstract screening

1.



0 Unreviewed



3043 Reviewed by you



0 My Conflicts



Full text screening - Full text screening

2.



1347 Unreviewed



203 Reviewed by you



0 My Conflicts



Data extraction - Data extraction Xylella Host P...

3.



104 Unreviewed



0 Reviewed by you



0 My Conflicts

Resources & Methodologies

All the steps were revised by two reviewers

1° Step: Title and Abstract screening:

*Is Xylella the topic of the study? Yes/No
Is it a primary research study? Yes/No*



2° Step: Full Text screening:

Is Xylella studied in association to a plant? Yes/No



3° Step: Data extraction

3038 ref.



1503 ref.



833 ref.

Resources & Methodologies

Third step in Excel: Data Extraction from 833 papers

	A	B	C	D	E	F	G	H	I	J
1	Info			Botanical identification of the plant			kind of infection			
2	Ref-Id	Reference	User	Family	Plant species	Cultivar	Year	natural	artificial	location
3	55	Abrahams BR and Norton JD, 19	Alice	Rosaceae	Prunus sp.	Lovell	1994		mechanical with budding	greenhouse
4	55	Abrahams BR and Norton JD, 19	Alice	Rosaceae	Prunus sp.	Nemaguard	1994		mechanical with budding	greenhouse
5	57	Adams JP, Rousseau RJ and Leir	Alice	Platanaceae	Platanus occidentalis		2002		mechanical with needle	greenhouse
6	74	Aguilar E, Moreira L and Rivera	Alice	Vitaceae	Vitis vinifera		2003	during survey activity		field
7	74	Aguilar E, Moreira L and Rivera	Alice	Vitaceae	Vitis vinifera		2003	during survey activity		field
8	74	Aguilar E, Moreira L and Rivera	Alice	Vitaceae	Vitis vinifera		2003	during survey activity		field
9	76	Aguilar E, Villalobos W, Moreir	Alice	Rutaceae	Citrus sinensis		2001-2005	during survey activity		field

Resources & Methodologies

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9	76	Aguilar E, Villalobos W, Moreir	Alice	Rutaceae	Citrus sinensis		2001-2005	during survey activity		field

- **Botanical identification of the plant:** Family, Genus, Species, Cultivar and Common name
- **Infection determination:** Year, Natural / Artificial, Greenhouse / Field
- **Location:** Country, Location, Latitude, Longitude

Resources & Methodologies

Third step in Excel: Data Extraction from 833 papers

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8	74	Aguilar E, Moreira L and Rivera	Alice	Vitaceae	Vitis vinifera		2003	during survey activity		field
9	76	Aguilar E, Villalobos W, Moreir	Alice	Rutaceae	Citrus sinensis		2001-2005	during survey activity		field

- **Xylella identification:** Species, subspecies, Disease name, Strain/Isolate, MLST
- **Identification methods applied:** Observation of Symptoms, Culture, Microscope, E.L.I.S.A., Other immunological techniques, PCR , Sequencing

$$POS / NEG$$

$$n. \text{ positive plants} / \text{total } n. \text{ of tested plants}$$
- **Host suitability:** Resistant / Susceptible / Tolerant / Systemic / Localized / ecc...

Resources & Methodologies

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833 papers selected



data already extracted from 700 papers (85%)

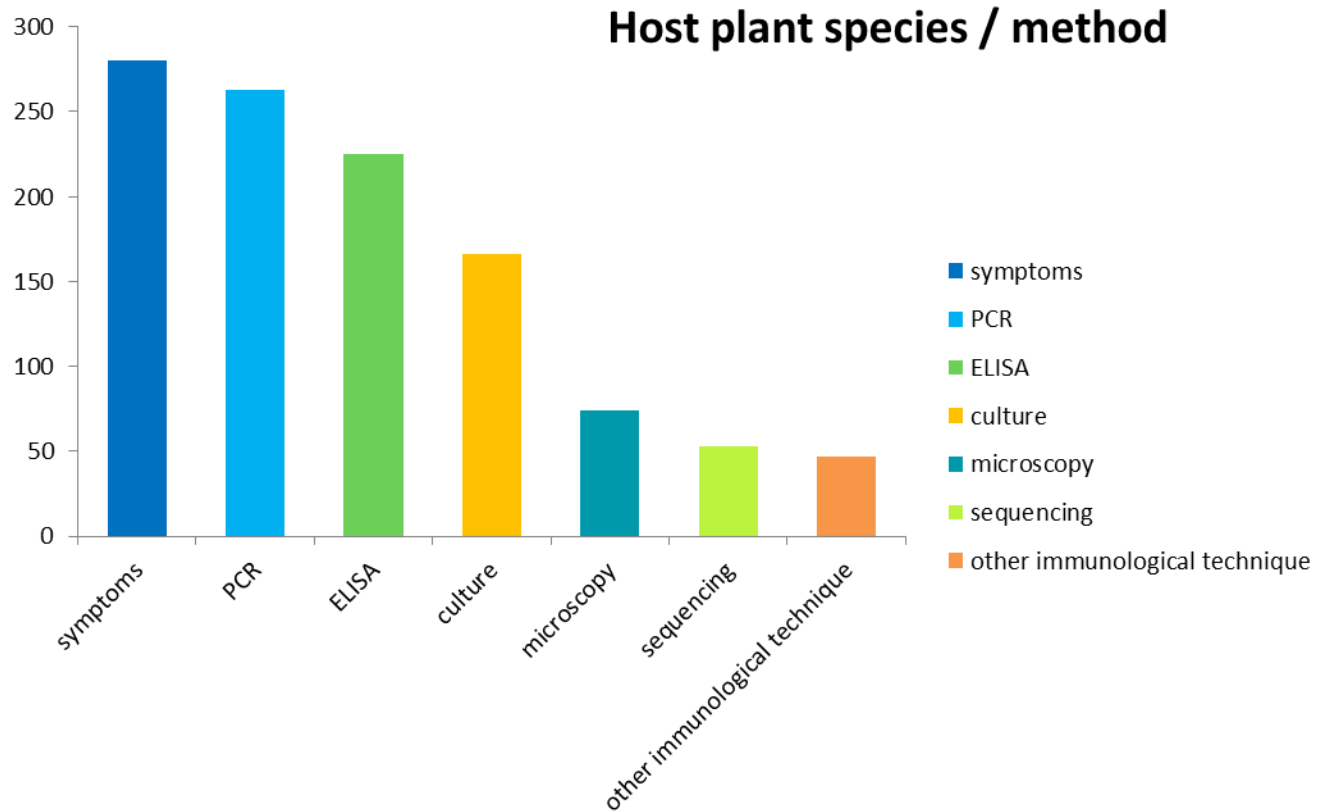


5720 excel rows



each row is a unique combination of data

Preliminary results





Preliminary results

	All identification methods
Species	445
Genera	221
Families	80

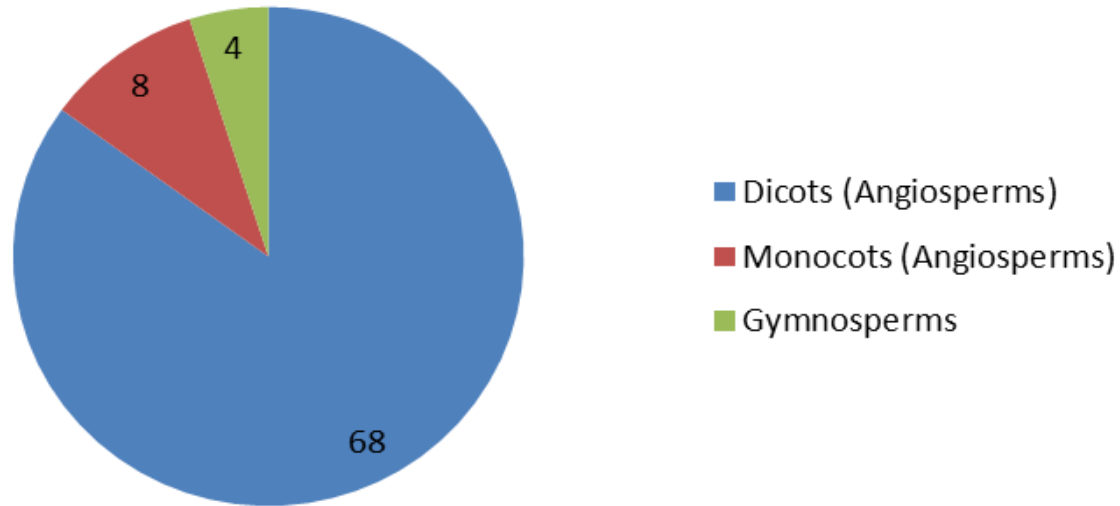


Preliminary results

	All identification methods	PCR, ELISA, culture, sequencing, other immunological techniques
Species	445	365
Genera	221	193
Families	80	76

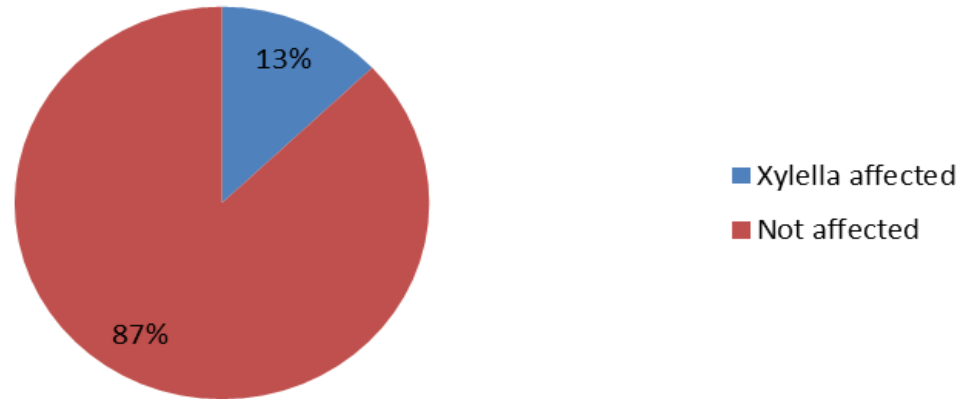
Preliminary results

Xylella host plants families



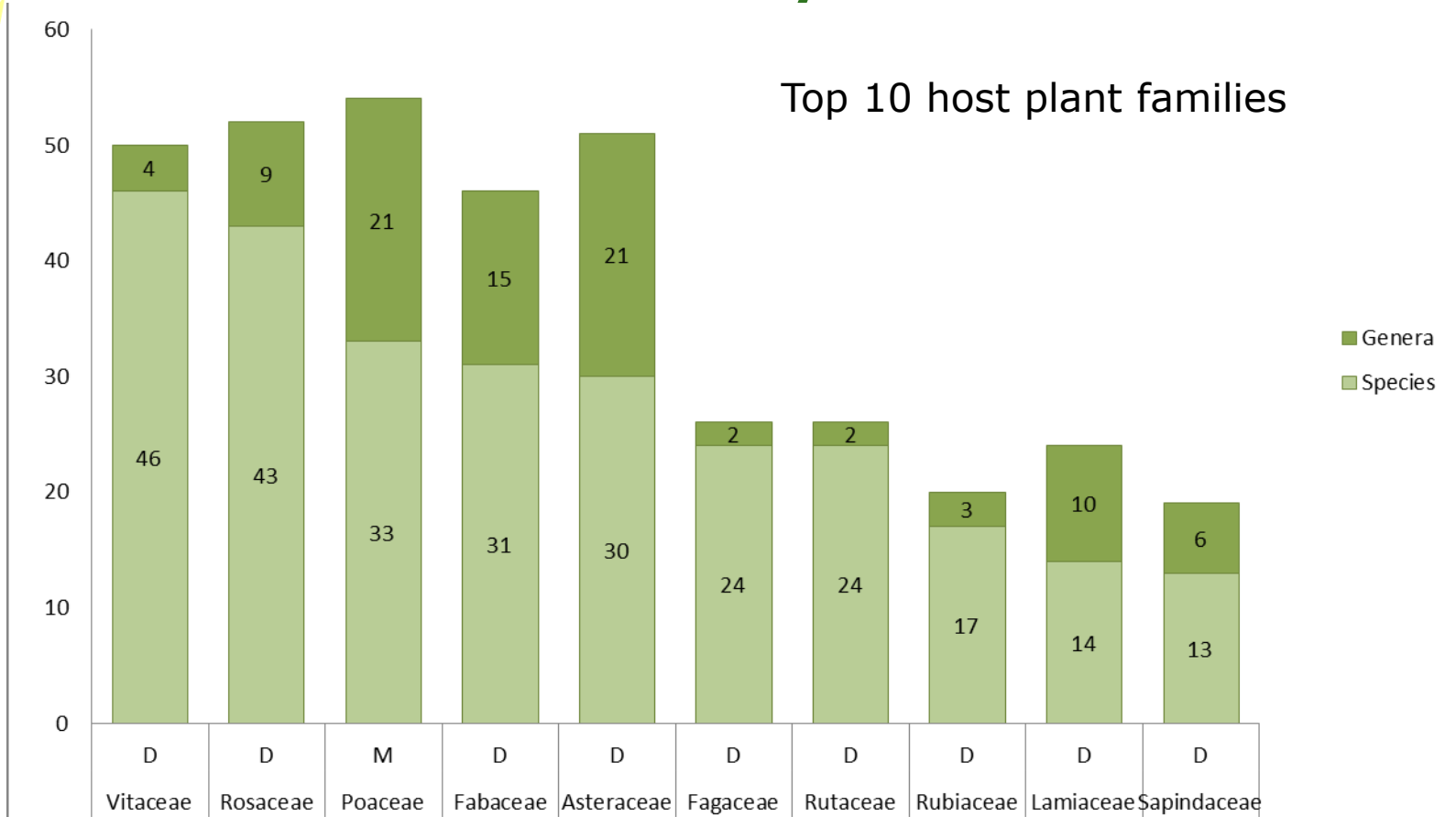
Preliminary results

***Xylella* host plant families
VS
total number of families in the world**



Preliminary results

Top 10 host plant families





Preliminary conclusions

- The number of the known host plants species is increasing
- Top 10 host plant families include many important crops, ornamental and forestry species
- The majority of host plants of *Xylella* are detected by symptom observation, PCR and ELISA
- *Xylella* host plant database as useful tool for risk assessors, risk managers, researchers and local authorities
- The updated database will be published soon

A close-up photograph of an olive branch. The branch features several elongated, silvery-green leaves with a slightly textured surface. Interspersed among the leaves are several olives in various stages of ripeness. Some are bright green, while others are a deep, dark purple-black. The background is softly blurred, showing more foliage and branches, creating a sense of depth. The lighting is natural, highlighting the textures of the leaves and the smooth surfaces of the olives.

Thanks for your attention!