Xylella host plant database

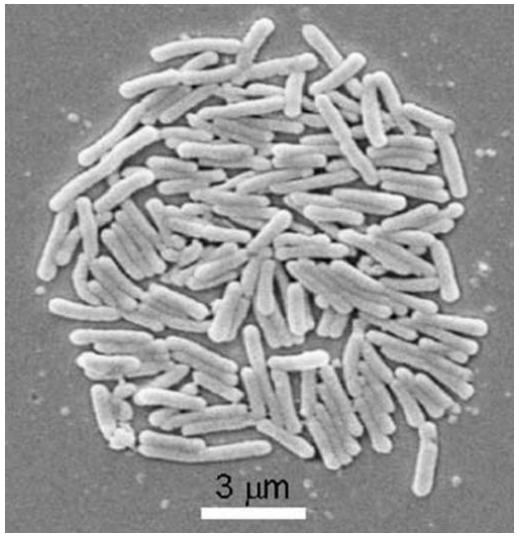
IPA Autumn school, 11-12 November 2025

ALZBETA MIKULOVA, ALICE DELBIANCO, GIUSEPPE STANCANELLI

EUROPEAN FOOD SAFETY AUTHORITY

XYLELLA FASTIDIOSA

- Gammaproteobacterium
- Native to Americas
- Insect vectors - Auchenorrhyncha
- Damage to *Vitis vinifera*, *Olea europaea, Prunus dulcis, Citrus* and other plants
- **6 Different subspecies:**
  - *Xylella fastidiosa* subsp. *fastidiosa*
  - *Xylella fastidiosa* subsp. *morus*
  - *Xylella fastidiosa* subsp. *multiplex*
  - *Xylella fastidiosa* subsp. *pauca*
  - *Xylella fastidiosa* subsp. *sandyi*
  - *Xylella fastidiosa* subsp. *tashke*
- **89 Different sequence types (STs):**
  - ST1, ST29, ST6, ST53, ST5, …..
- **Different isolates:**
  - Stag's Leap
  - ESVL
  - De Donno
  - …..



* Mizell, R. F., Andersen, P. C., Tipping, C., & Brodbeck, B. V. (2008). Xylella fastidiosa diseases and their leafhopper vectors. *Dept. of Entomology and Nematology, Florida Cooperative Extension Service, University of Florida. ENY, 683*.

FIRST OUTBREAK IN EUROPE OF *XYLELLA FASTIDIOSA* IN 2013

- 21 October 2013: detection of *X. fastidiosa* in Lecce province was notified to the European Commission
- First confirmation of this pest in field condition in the EU

Journal of Plant Pathology (2013), **95** (3), 659-668

DISEASE NOTE

IDENTIFICATION OF DNA SEQUENCES RELATED TO *XYLELLA FASTIDIOSA* IN OLEANDER, ALMOND AND OLIVE TREES EXHIBITING LEAF SCORCH SYMPTOMS IN APULIA (SOUTHERN ITALY)

M. Saponari[1], D. Boscia[1], F. Nigro[2] and G.P. Martelli[1,2]

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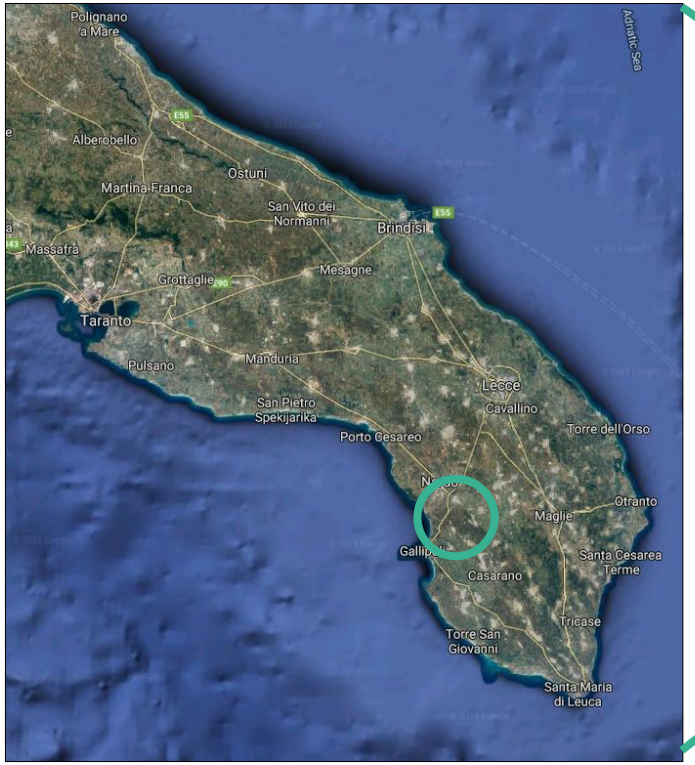
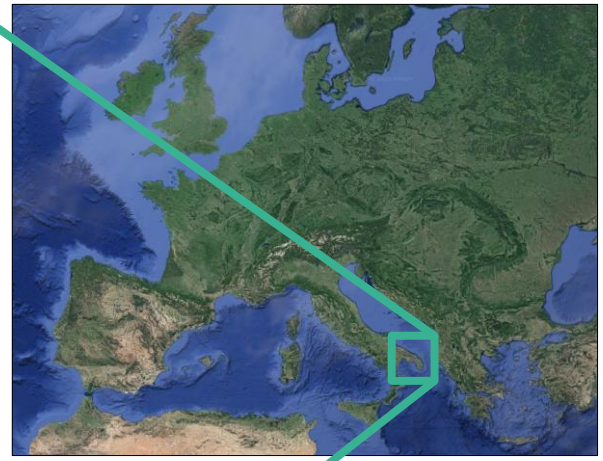
[2]Dipartimento di Scienze del Suolo, della Pianta e degli Alimenti, Università degli Studi di Bari Aldo Moro, Via Amendola 165/A 70126 Bari, Italy





THE EFSA HOST PLANT DATABASE – BACKGROUND

2013

- List of the University of Berkeley: 132 host plant species

efsa
European Food Safety Authority

EFSA Journal 2013;11(11):3468

STATEMENT OF EFSA

Statement of EFSA on host plants, entry and spread pathways and risk reduction options for *Xylella fastidiosa* Wells et al.[1]

European Food Safety Authority[2, 3]

European Food Safety Authority (EFSA), Parma, Italy

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- Further characterized: 312 host plant species

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2016
- Update in 2016: 359 host plant species

MANDATES FROM THE EUROPEAN COMMISSION TO EFSA ON THE *XYLELLA* HOST PLANTS DATABASE

- 2016:
  - Further specify and update the list of host plant species
  - Including information on
    - subspecies, strains, isolates
    - natural and artificial infections
    - on tolerance and resistance
- First edition: September 2018
- Update April 2020

- 2021-2026:
  - Two updates per year

- June 2021
- January 2022, June 2022
- January 2023, June 2023
- December 2023, July 2024
- February 2025, July 2025
- Next in January 2026 and June 2026

THE PROCESS

1
- Extensive literature search

Search string, all years, all languages
(Scopus, Web of Science, Europhyt Outbreaks notification platform)

2
- Screening of the collected literature

✓*Title / abstract screening*
✓*Full text screening*
✓*Two reviewers*

3
- Data extraction

4
- Data analysis and reporting

DATA EXTRACTION

General information:

Reference, publication year, starting and ending year of the study

Botanical identification of the plant:

Family, genus, species, varieties, common name

Infection method:

Natural, artificial, not specified, vector

(with subcategories)

Geographic information:

Country, location, coordinates if available

Pest description:

Species, subspecies, disease, strain, ST

Identification methods:

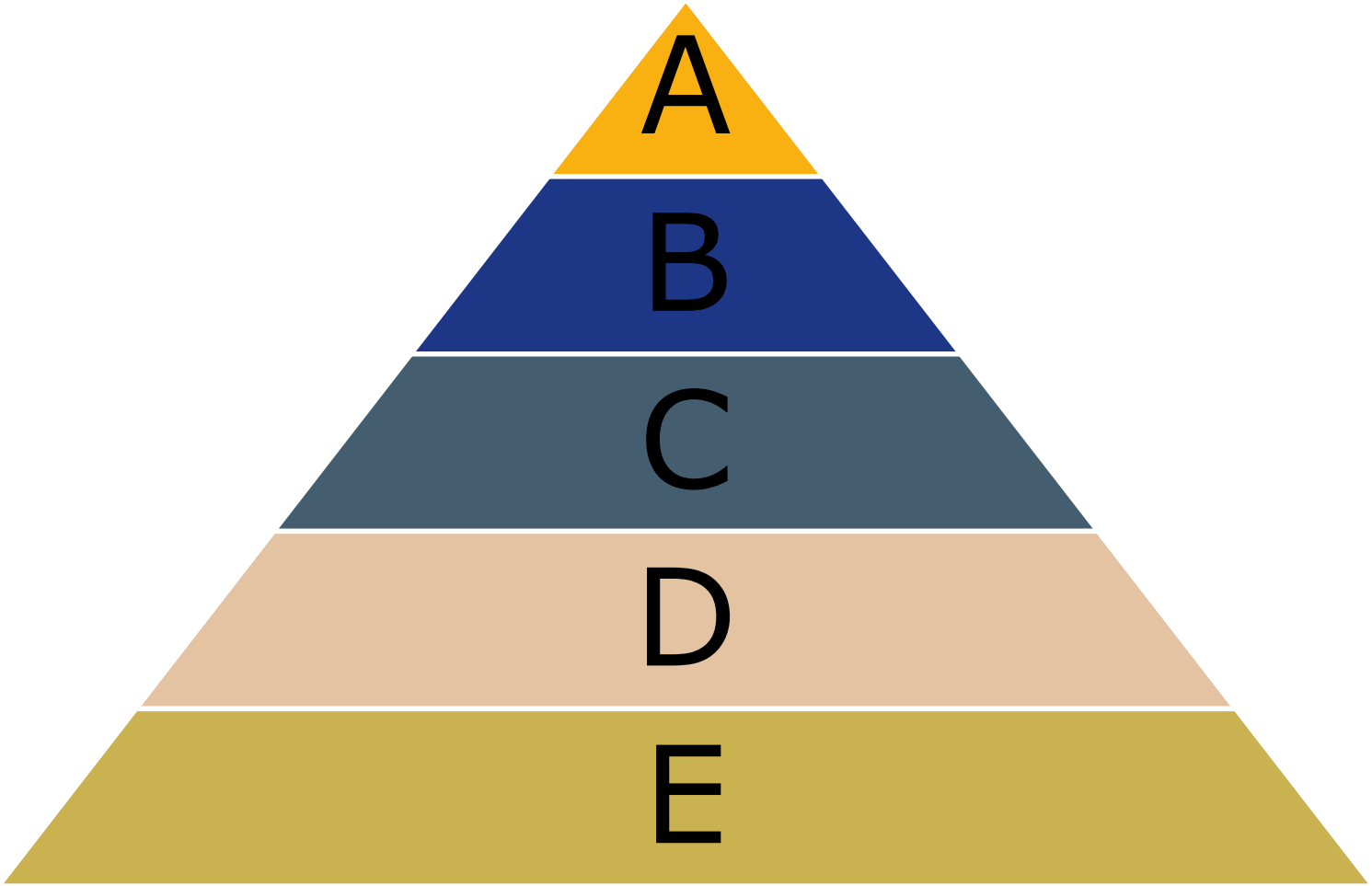
Symptoms, microscopy, culture, immunological tech., PCR, sequencing

Host status:

Info on tolerance/resistance

DATA ANALYSIS AND REPORTING

- Data analysis and reporting was designed to distinguish the *Xylella* spp. host plant species, based on the number and type of detection methods applied for each finding



THE EFSA HOST PLANT DATABASE

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Update of the *Xylella* spp. host plant database – Systematic literature search up to 31 December 2024

European Food Safety Authority (EFSA), Vincenzo Cavalieri, Elisa Fasanelli, Giandomenico Furnari, Davide Gibin, Alicia Gutierrez Linares, Pierfederico La Notte, Luca Pasinato, Giuseppe Stancanelli

First published: 23 July 2025 | https://doi.org/10.2903/j.efsa.2025.9563

Approved: 30 June 2025
The declarations of interest of all scientific experts active in EFSA's work are available at https://open.efsa.europa.eu/experts

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THE EFSA HOST PLANT DATABASE

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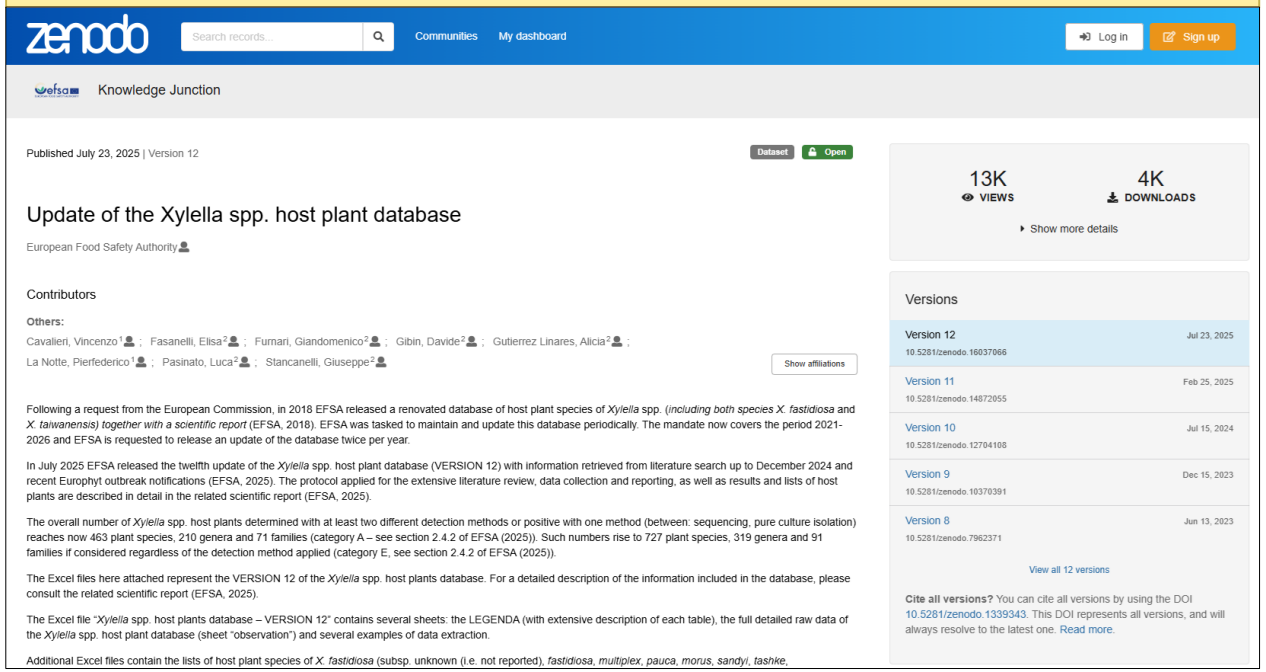
Excel files published in Zenodo:



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efsa Knowledge Junction

Published July 23, 2025 | Version 12

Dataset Open

13K VIEWS 4K DOWNLOADS

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Update of the Xylella spp. host plant database

European Food Safety Authority

Contributors

Others:

Cavalieri, Vincenzo[1]; Fasanelli, Elisa[2]; Furnari, Giandomenico[2]; Gibin, Davide[2]; Gutierrez Linares, Alicia[2]; La Notte, Pierfederico[1]; Pasinato, Luca[2]; Stancanelli, Giuseppe[2]

Show affiliations

Following a request from the European Commission, in 2018 EFSA released a renovated database of host plant species of *Xylella* spp. (*including both species X. fastidiosa* and *X. taiwanensis) together with a scientific report* (EFSA, 2018). EFSA was tasked to maintain and update this database periodically. The mandate now covers the period 2021-2026 and EFSA is requested to release an update of the database twice per year.

In July 2025 EFSA released the twelfth update of the *Xylella* spp. host plant database (VERSION 12) with information retrieved from literature search up to December 2024 and recent Europhyt outbreak notifications (EFSA, 2025). The protocol applied for the extensive literature review, data collection and reporting, as well as results and lists of host plants are described in detail in the related scientific report (EFSA, 2025).

The overall number of *Xylella* spp. host plants determined with at least two different detection methods or positive with one method (between: sequencing, pure culture isolation) reaches now 463 plant species, 210 genera and 71 families (category A – see section 2.4.2 of EFSA (2025)). Such numbers rise to 727 plant species, 319 genera and 91 families if considered regardless of the detection method applied (category E, see section 2.4.2 of EFSA (2025)).

The Excel files here attached represent the VERSION 12 of the *Xylella* spp. host plants database. For a detailed description of the information included in the database, please consult the related scientific report (EFSA, 2025).

The Excel file "*Xylella* spp. host plants database – VERSION 12" contains several sheets: the LEGENDA (with extensive description of each table), the full detailed raw data of the *Xylella* spp. host plant database (sheet "observation") and several examples of data extraction.

Additional Excel files contain the lists of host plant species of *X. fastidiosa* (subsp. unknown (i.e. not reported), *fastidiosa*, *multiplex*, *pauca*, *morus*, *sandyi*, *tashke*,

Versions

Version 12 Jul 23, 2025 10.5281/zenodo.16037066

Version 11 Feb 25, 2025 10.5281/zenodo.14872055

Version 10 Jul 15, 2024 10.5281/zenodo.12704108

Version 9 Dec 15, 2023 10.5281/zenodo.10370391

Version 8 Jun 13, 2023 10.5281/zenodo.7962371

View all 12 versions

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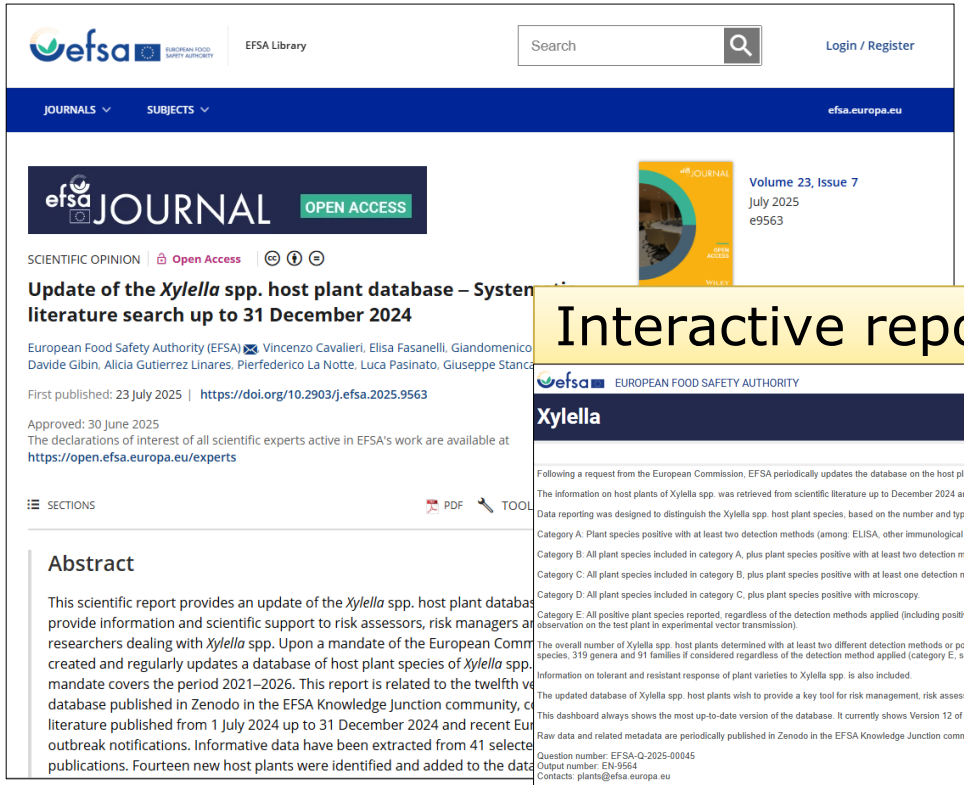
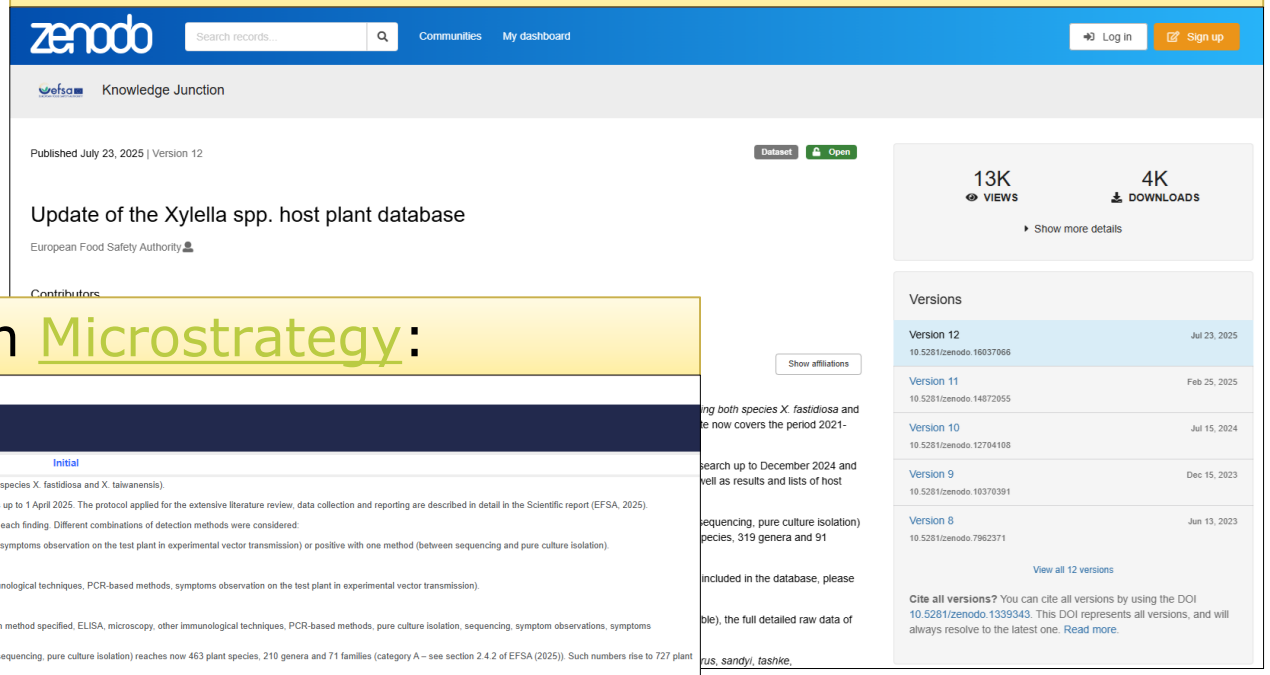
THE EFSA HOST PLANT DATABASE

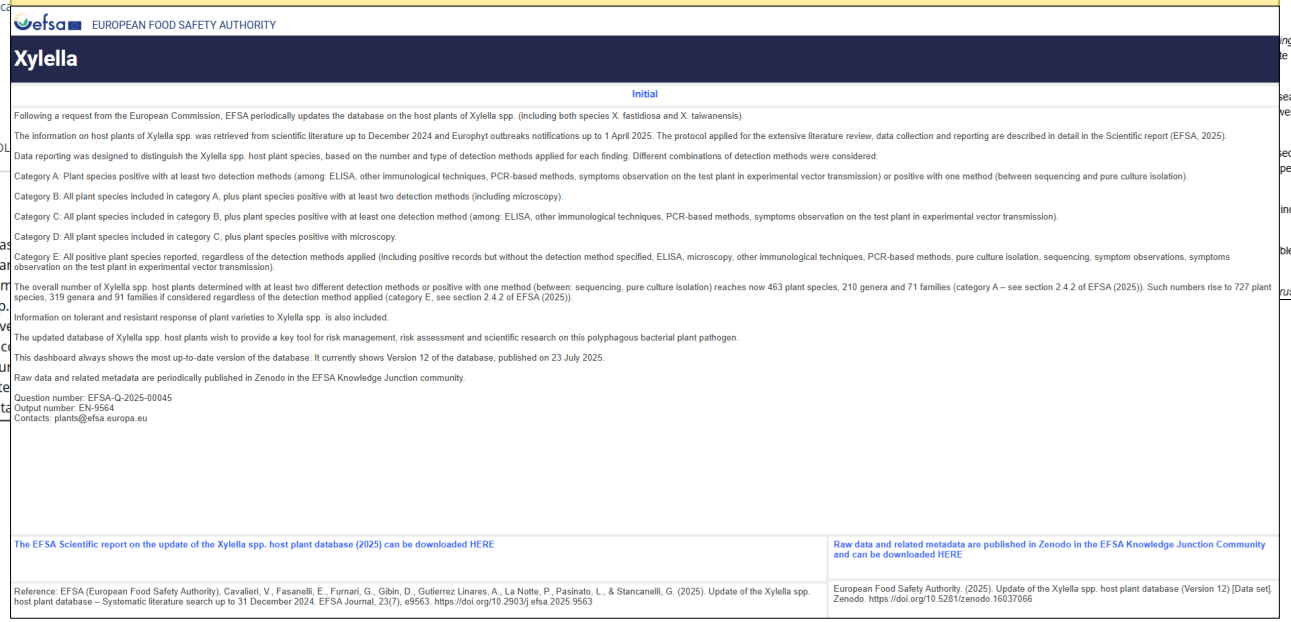
Scientific report on EFSA Journal:



Excel files published in Zenodo:



Interactive reports in Microstrategy:



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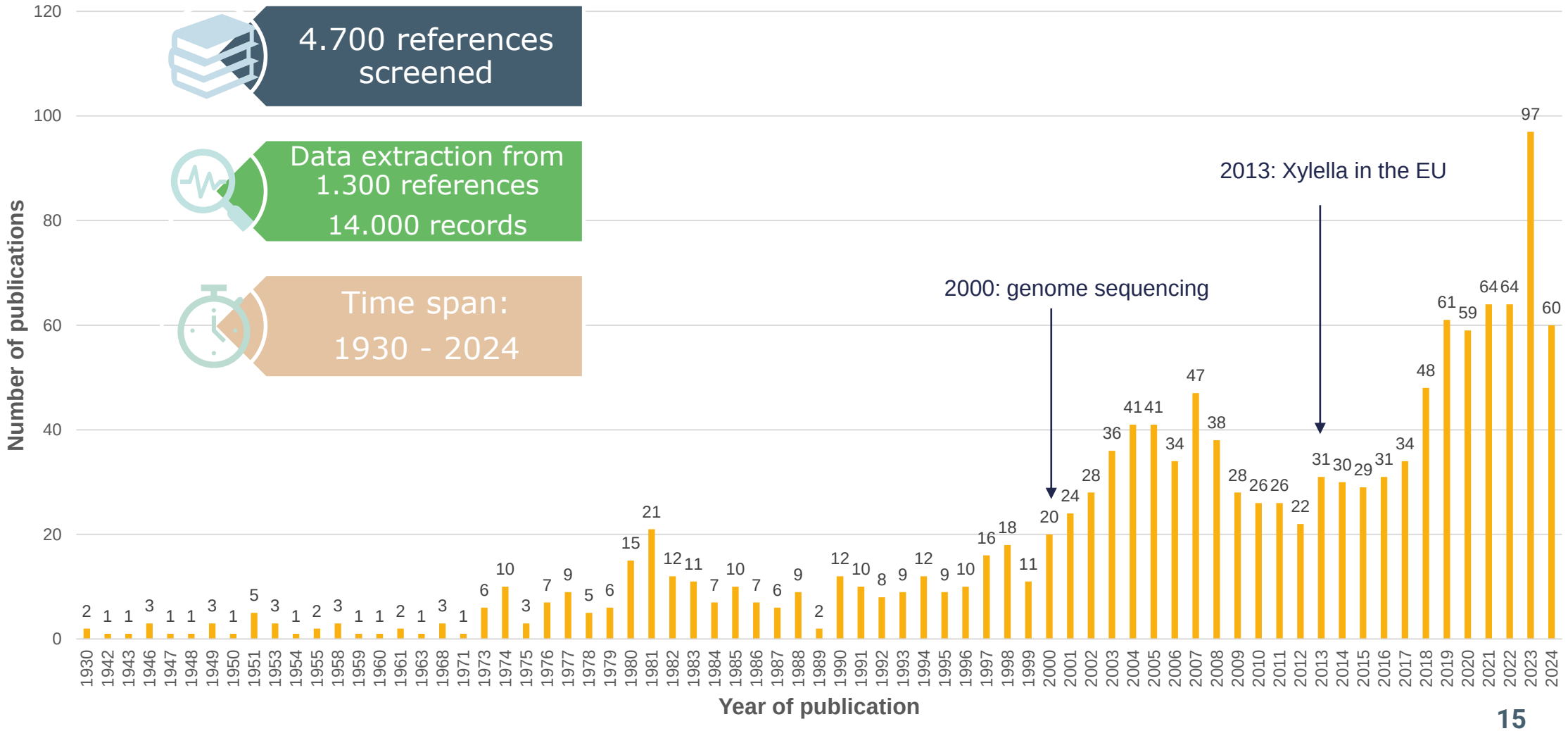


NUMBER OF HOST PLANTS

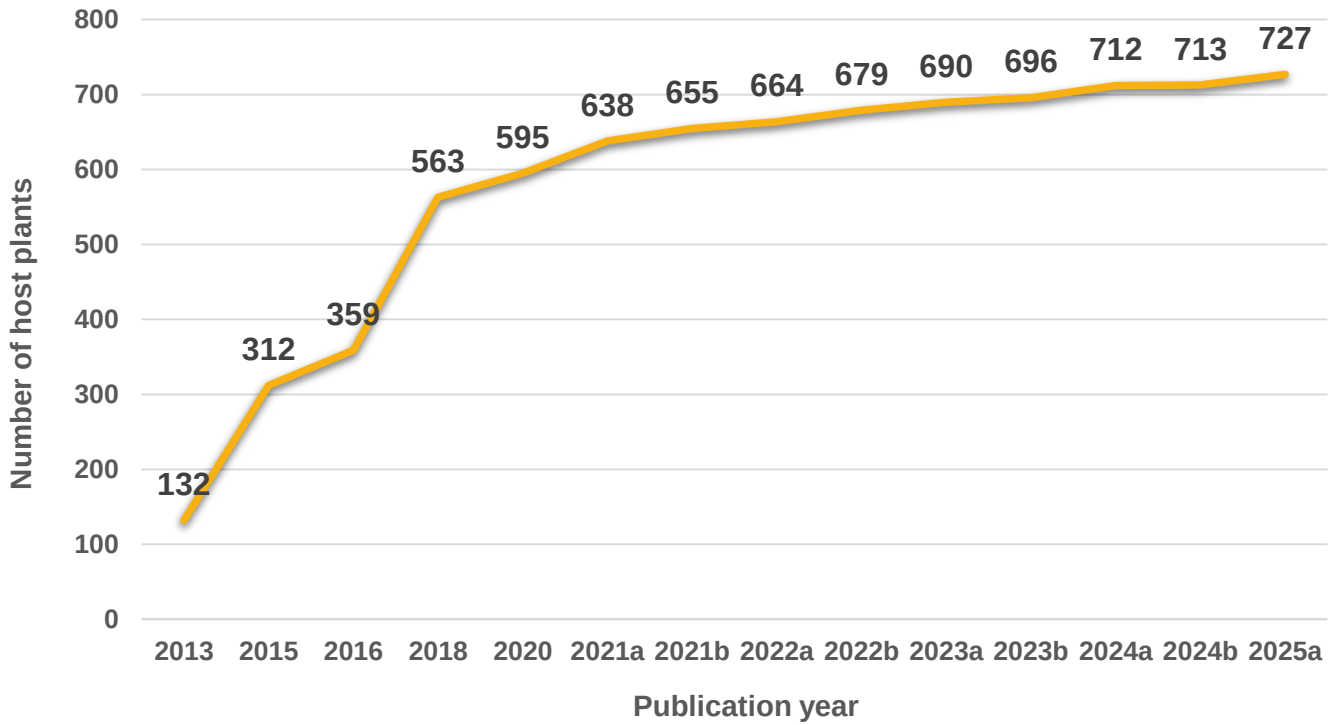
Category A: 463 species, 210 genera, 71 families

Category B: 468 species, 211 genera, 71 families

Category C: 713 species, 318 genera, 91 families

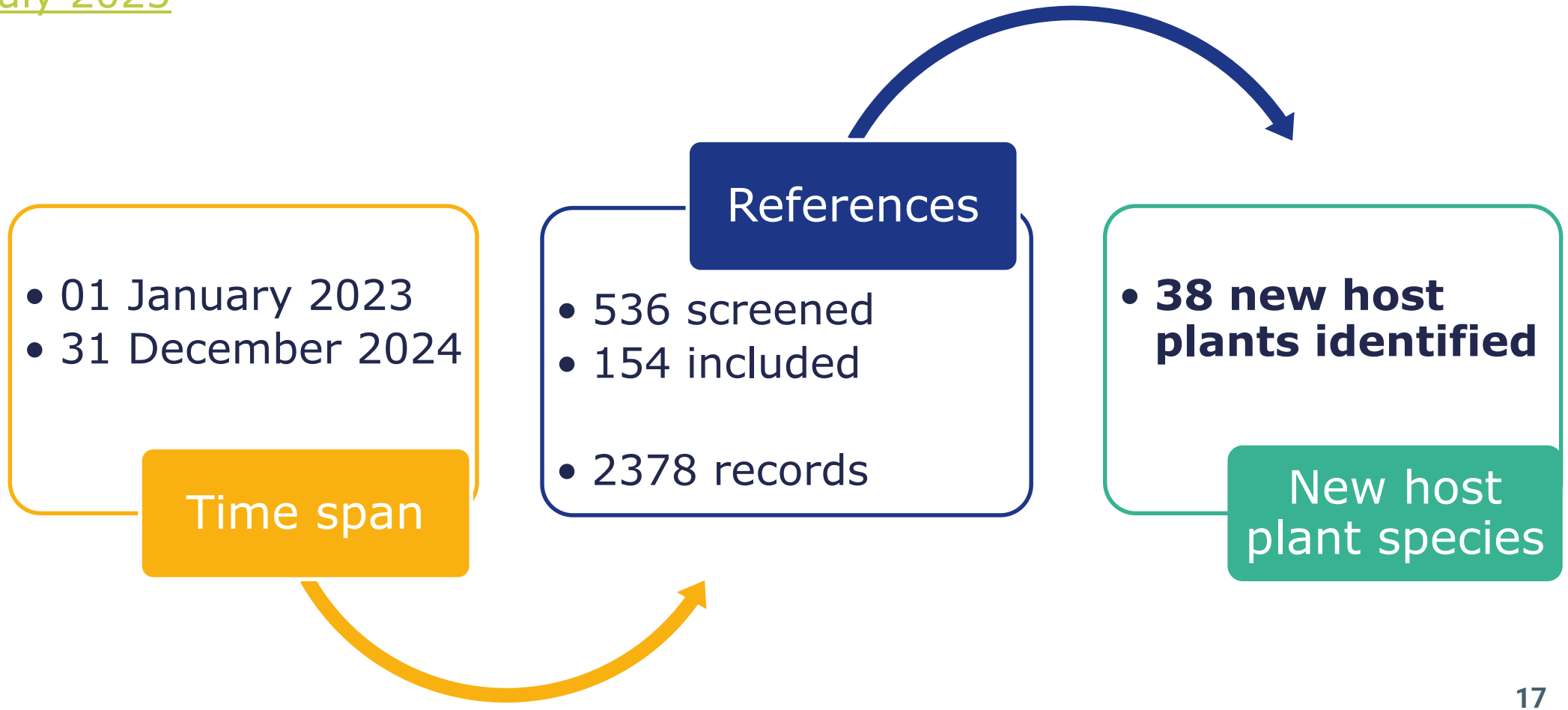
Category D: 722 species, 318 genera, 91 families

Category E: 727 species, 319 genera, 91 families

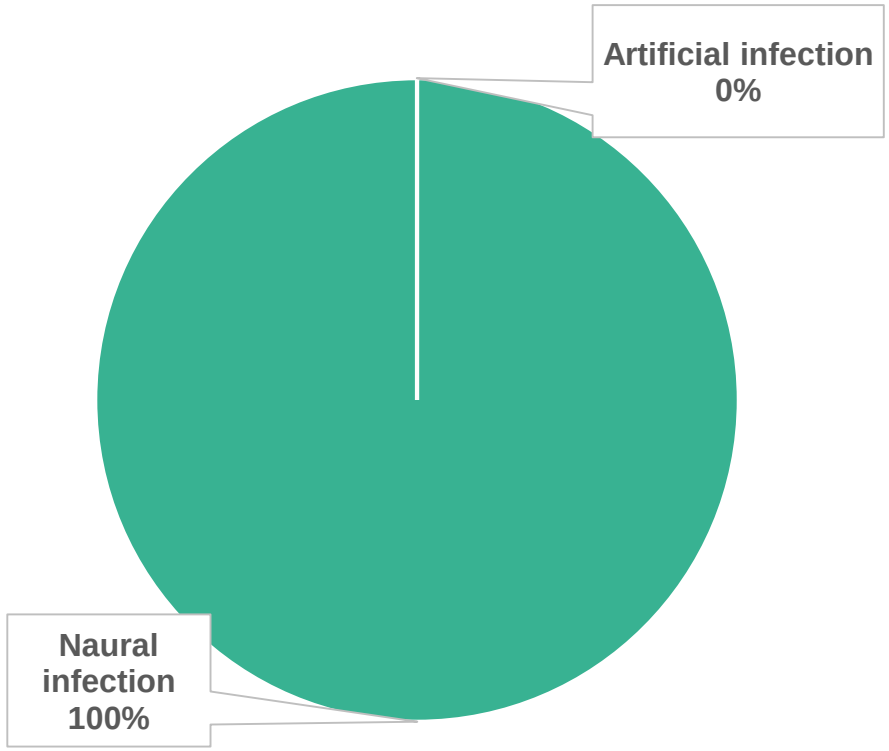


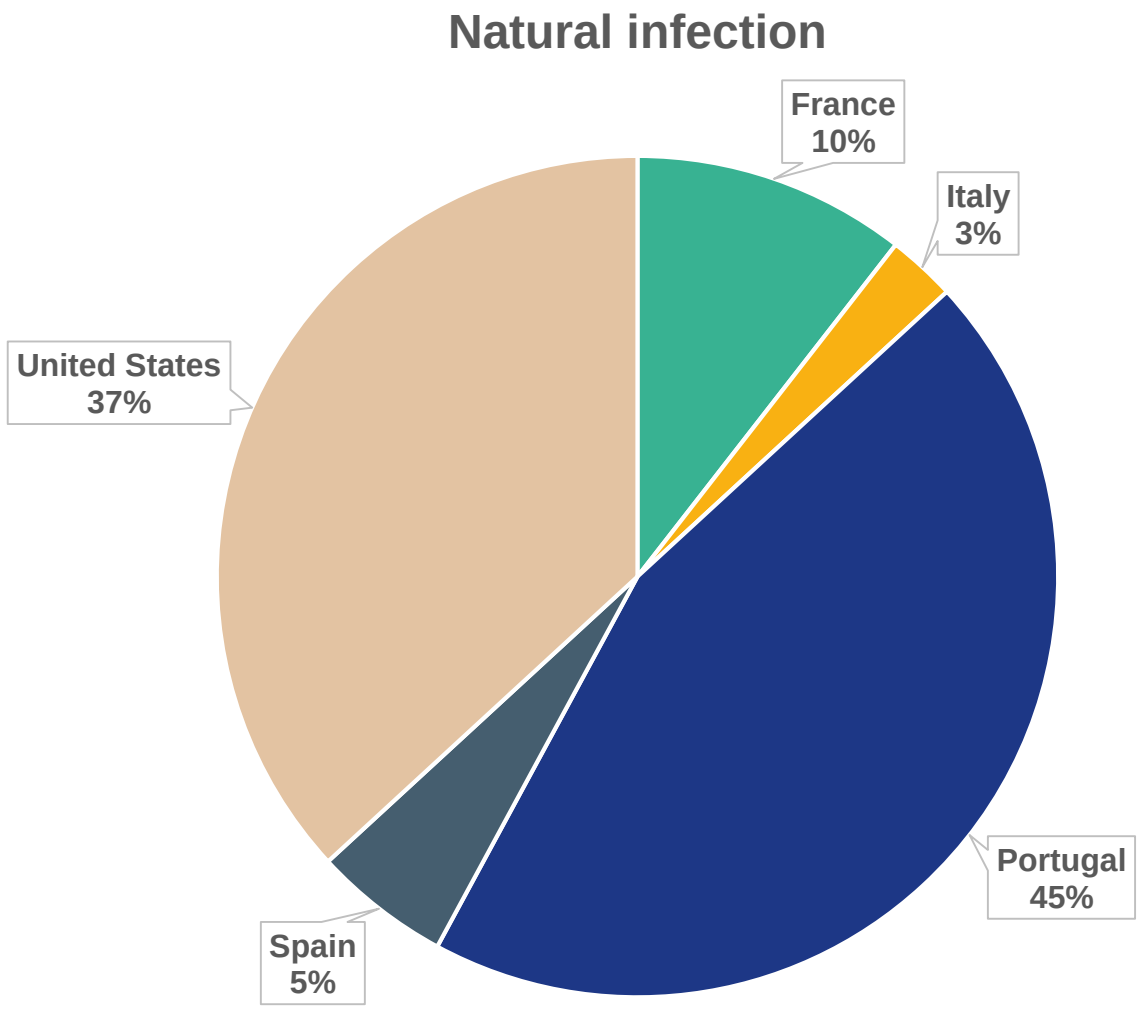
NEW HOST PLANTS RECENTLY IDENTIFIED

Last 4 updates (covering 2 years): December 2023, July 2024, February 2025, July 2025



NEW HOST PLANT SPECIES





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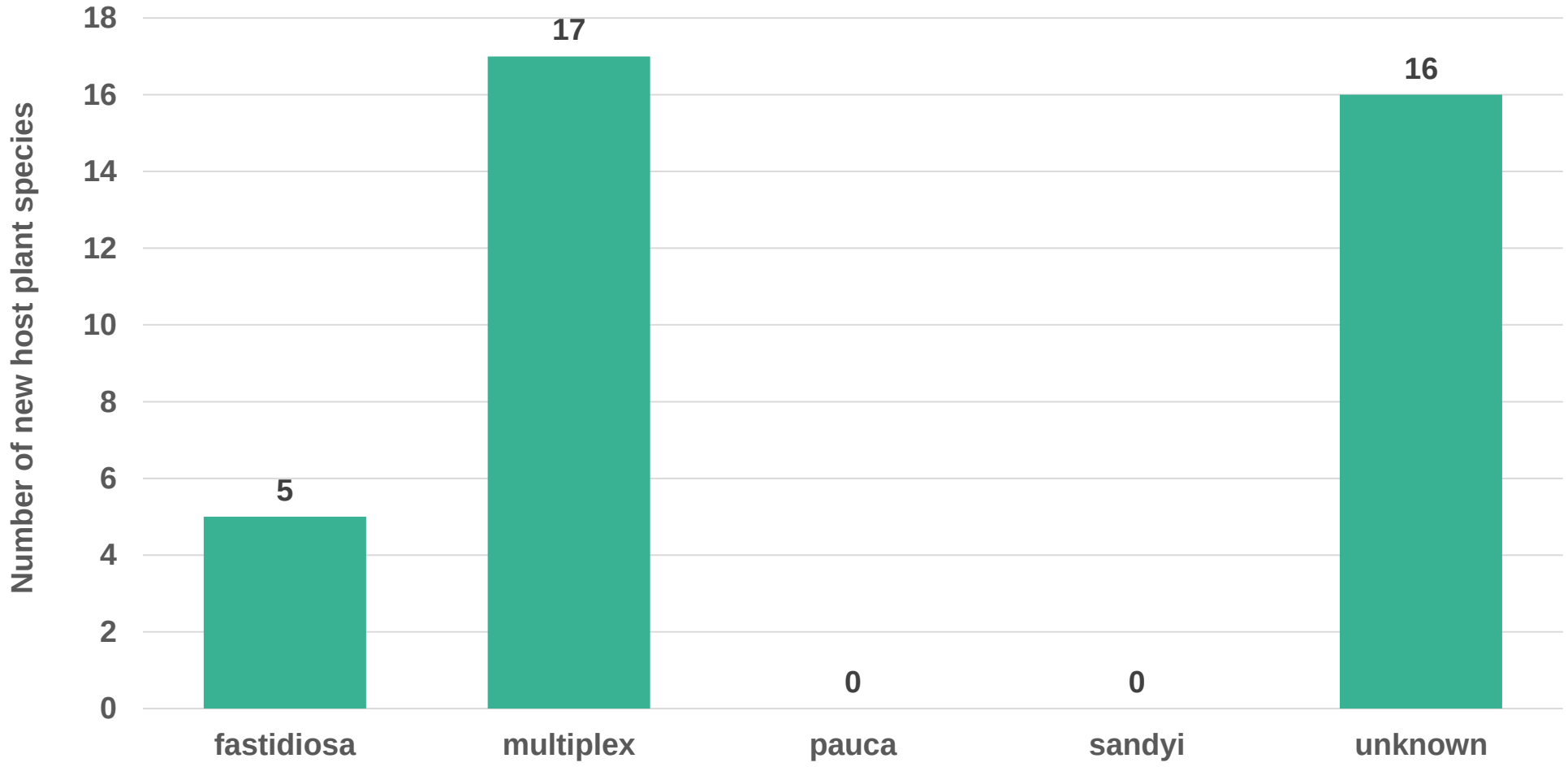

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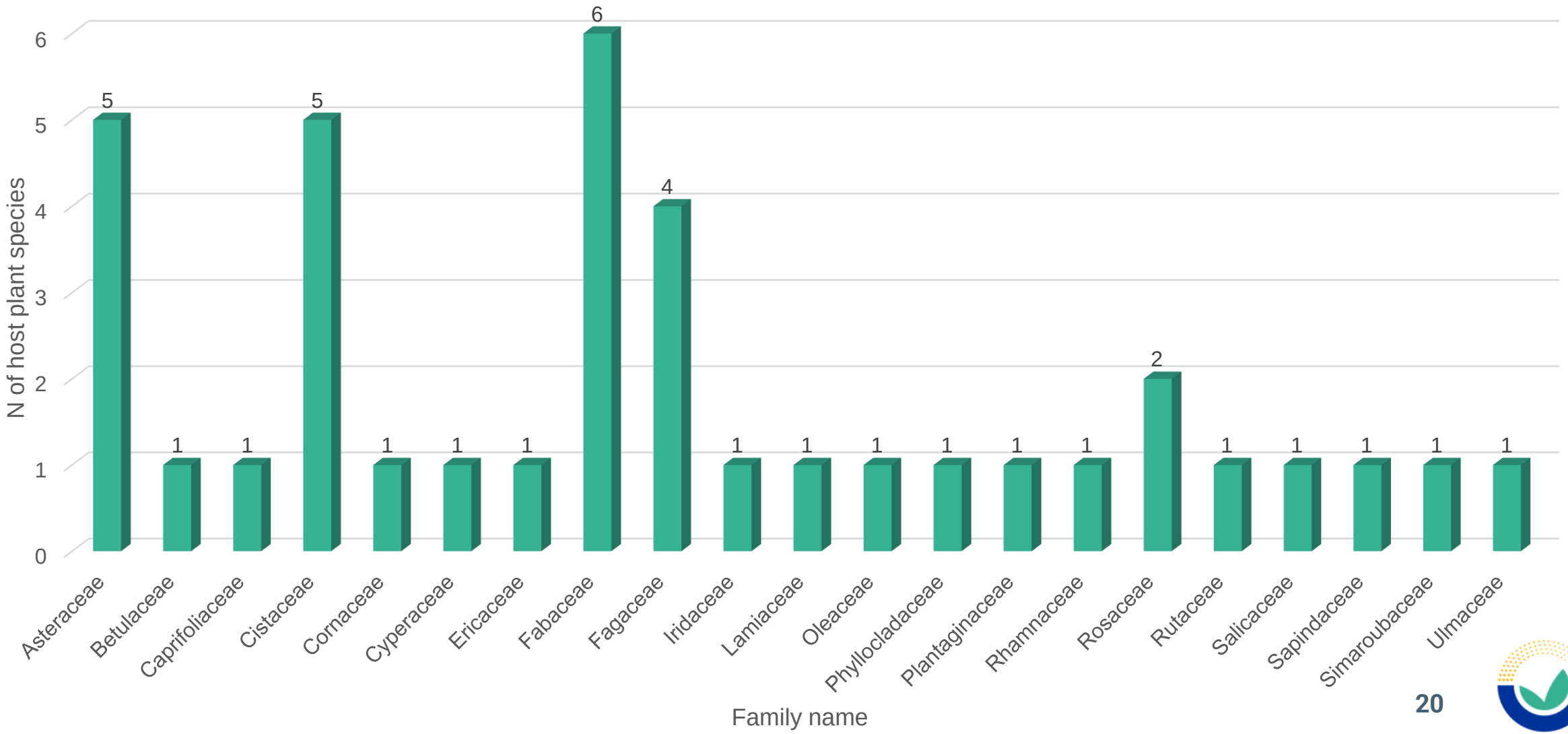


SOME OF THE NEW HOST PLANT SPECIES

Prunus spinosa

® Wikipedia

Senecio inaequidens

® Wikipedia

Fraxinus excelsior

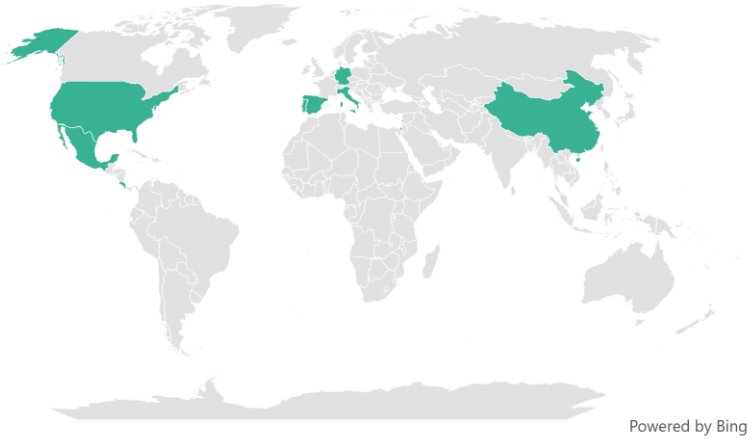
® Wikipedia

Ailanthus altisiuma

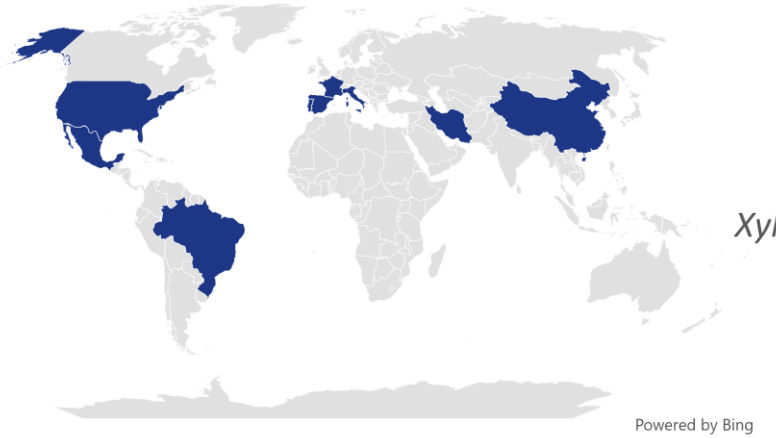
® Wikipedia

DISTRIBUTION OF DIFFERENT SUBSPECIES IN NATURAL INFECTION

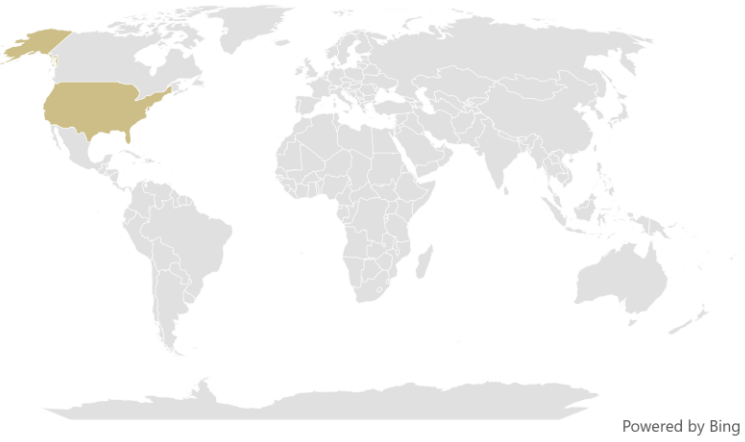
Xylella fastidiosa subsp. *fastidiosa*



Xylella fastidiosa subsp. *multiplex*

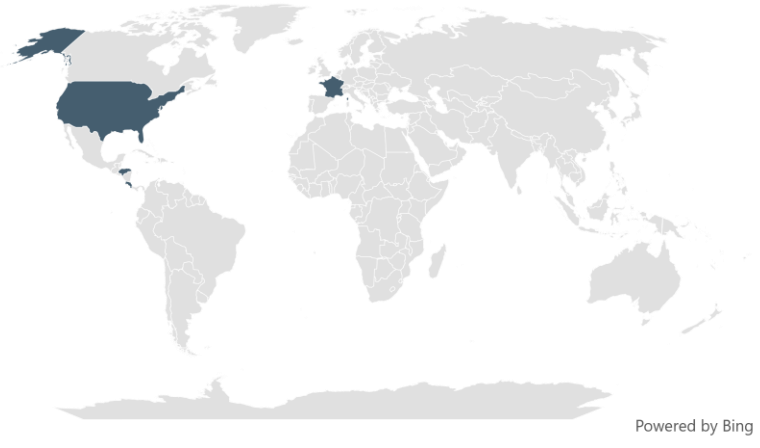


Xylella fastidiosa subsp. *morus* and *X. f.* subsp. *tashke*



Xylella fastidiosa subsp. *pauca*

Xylella fastidiosa subsp. *sandyi*



CONCLUSIONS

- Many new host plants of *Xylella* spp. are identified every time a new outbreak is investigated in a new area or in a new agroecosystem
- The EFSA global database on *Xylella* spp. host plants supports risk assessors, researchers, stakeholders, risk managers and local authorities
- Next update will be published in January 2026

Photos of *Xylella* Pierce's disease in grapes provided by courtesy of Alexandra Kahn and Monica Donegan, University of California Berkeley

PRACTICAL EXERCISE

EUROPEAN FOOD SAFETY AUTHORITY

Xylella

Initial

Following a request from the European Commission, EFSA periodically updates the database on the host plants of Xylella spp. (including both species X. fastidiosa and X. taiwanensis).

The information on host plants of Xylella spp. was retrieved from scientific literature up to December 2024 and Europhyt outbreaks notifications up to 1 April 2025. The protocol applied for the extensive literature review, data collection and reporting are described in detail in the Scientific report (EFSA, 2025).

Data reporting was designed to distinguish the Xylella spp. host plant species, based on the number and type of detection methods applied for each finding. Different combinations of detection methods were considered:

Category A: Plant species positive with at least two detection methods (among: ELISA, other immunological techniques, PCR-based methods, symptoms observation on the test plant in experimental vector transmission) or positive with one method (between sequencing and pure culture isolation).

Category B: All plant species included in category A, plus plant species positive with at least two detection methods (including microscopy).

Category C: All plant species included in category B, plus plant species positive with at least one detection method (among: ELISA, other immunological techniques, PCR-based methods, symptoms observation on the test plant in experimental vector transmission).

Category D: All plant species included in category C, plus plant species positive with microscopy.

Category E: All positive plant species reported, regardless of the detection methods applied (including positive records but without the detection method specified, ELISA, microscopy, other immunological techniques, PCR-based methods, pure culture isolation, sequencing, symptom observations, symptoms observation on the test plant in experimental vector transmission).

The overall number of Xylella spp. host plants determined with at least two different detection methods or positive with one method (between: sequencing, pure culture isolation) reaches now 463 plant species, 210 genera and 71 families (category A – see section 2.4.2 of EFSA (2025)). Such numbers rise to 727 plant species, 319 genera and 91 families if considered regardless of the detection method applied (category E, see section 2.4.2 of EFSA (2025)).

Information on tolerant and resistant response of plant varieties to Xylella spp. is also included.

The updated database of Xylella spp. host plants wish to provide a key tool for risk management, risk assessment and scientific research on this polyphagous bacterial plant pathogen.

This dashboard always shows the most up-to-date version of the database. It currently shows Version 12 of the database, published on 23 July 2025.

Raw data and related metadata are periodically published in Zenodo in the EFSA Knowledge Junction community.

Question number: EFSA-Q-2025-00045
Output number: EN-9564
Contacts: plants@efsa.europa.eu

The EFSA Scientific report on the update of the Xylella spp. host plant database (2025) can be downloaded HERE	Raw data and related metadata are published in Zenodo in the EFSA Knowledge Junction Community and can be downloaded HERE
Reference: EFSA (European Food Safety Authority), Cavalieri, V., Fasanelli, E., Furnari, G., Gibin, D., Gutierrez Linares, A., La Notte, P., Pasinato, L., & Stancanelli, G. (2025). Update of the Xylella spp. host plant database – Systematic literature search up to 31 December 2024. EFSA Journal, 23(7), e9563. https://doi.org/10.2903/j.efsa.2025.9563	European Food Safety Authority. (2025). Update of the Xylella spp. host plant database (Version 12) [Data set]. Zenodo. https://doi.org/10.5281/zenodo.16037066