Databases of host species to support research on plant pests: the case of *Xylella fastidiosa*

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ROLE OF HOST PLANTS DATABASE

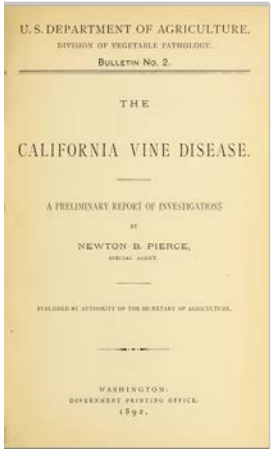
- Reliable host lists of generalist plant pests (e.g. *Anoplophora glabripennis, Ditylenchus destructor, Phytophthora ramorum*), are important for modelling, monitoring and regulatory needs

- Knowledge on the host range of a pest is crucial for all steps of Pest Risk Assessment and for Risk Management

- In the case of pest species with high genetic diversity, data related to genetic characterization (subspecies, strains, isolates) are extremely important

Xylella fastidiosa

- Plant pathogenic bacterium
- Described in California for the first time in 1892
- Detected in Europe for the first time in Apulia region (Southern Italy) in October 2013. Now present also in Corsica and Southern France (PAC Region).
- Has a very broad host range


U. S. DEPARTMENT OF AGRICULTURE.
DIVISION OF VEGETABLE PATHOLOGY.
BULLETIN No. 2.

THE

CALIFORNIA VINE DISEASE.

A PRELIMINARY REPORT OF INVESTIGATIONS

BY

NEWTON B. PIERCE,

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1892.

Xylella fastidiosa

- High uncertainty on its potential host range in the European flora
- All xylem fluid-feeding insects in Europe are considered to be potential vectors
- There is a potential for consequences in the EU, as shown by the severe impact on olive in Apulia



X. fastidiosa HOST PLANTS DATABASE

- Before the publication by EFSA of the *X. fastidiosa* host plant database other researchers (especially from USA) made available lists of *X. fastidiosa* host plants

- EFSA published the first *X. fastidiosa* host plant database in 2013, updated in 2015

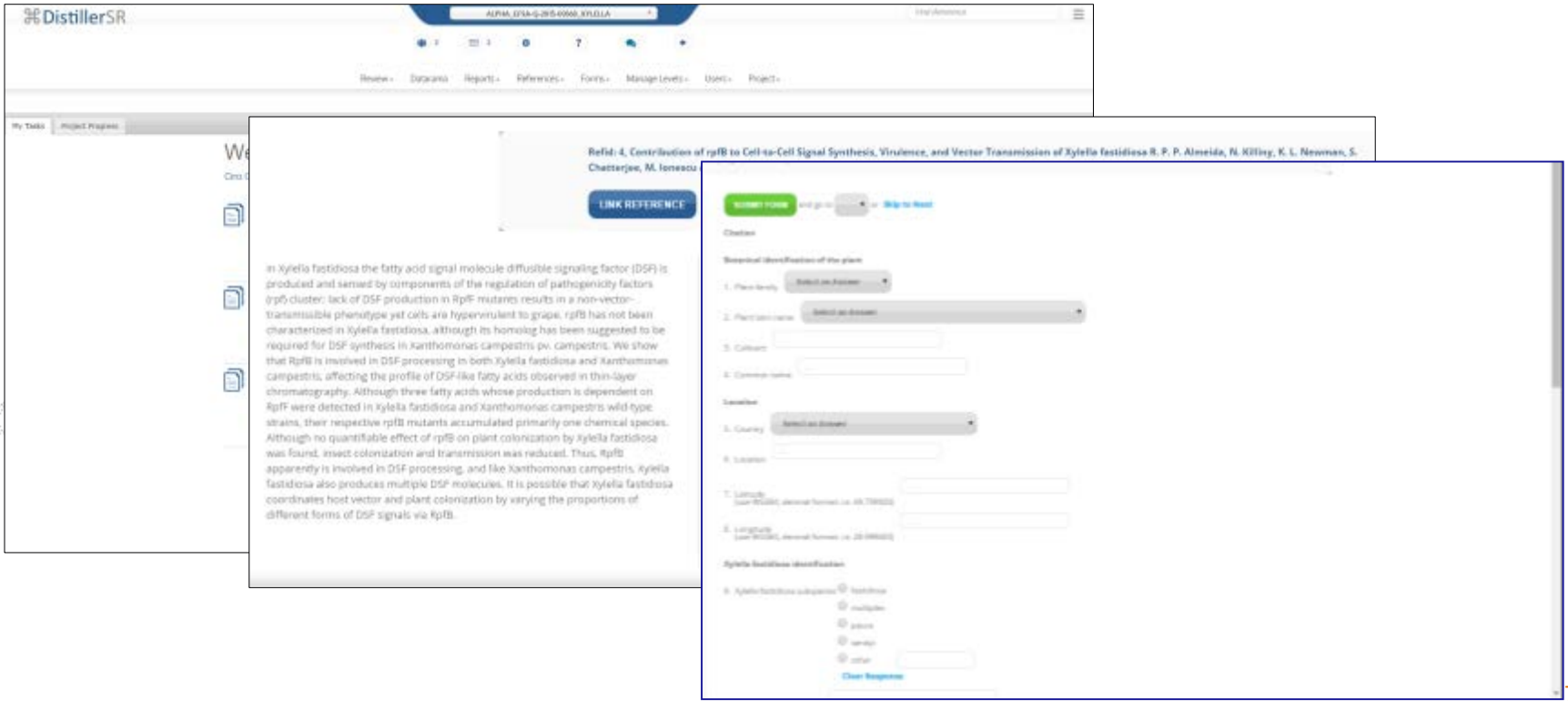
- EFSA is maintaining and keeping up to date a comprehensive database on host plants of *Xylella fastidiosa* on the basis of new scientific developments; new updates will be released

X. fastidiosa HOST PLANTS DATABASE

- EFSA host plant database is compiled with data extracted from scientific literature and includes:
  - Plant species and cultivars/varieties (when available)
  - Dates
  - Geographic location (location name and coordinates)
  - *X. fastidiosa* subspecies and strains
  - Type of data (experiment or survey)
  - Type of detection (e.g. microscopy, serology, molecular detection methods, culturing and identification of bacteria, etc.)

HOST PLANTS DATABASE UPDATES

The existing database adapted for migration into «Distiller»



HOST PLANTS DATABASE UPDATES

Literature search:

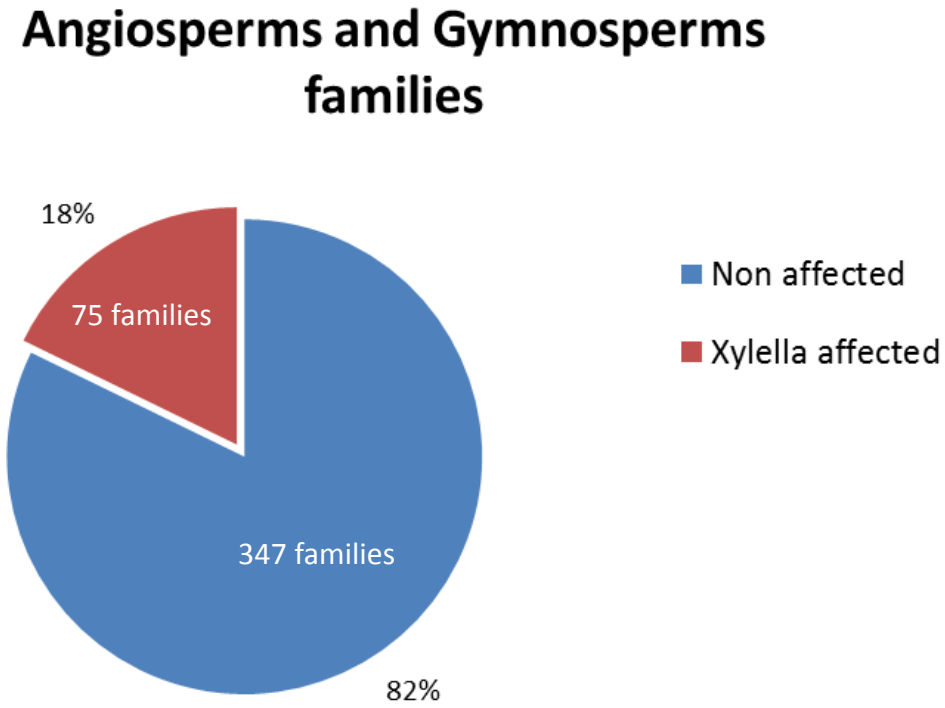
ISI Web of Science

('xylella')
OR
('Pierce* disease' OR 'Plum leaf scald' OR 'Phony disease' OR 'Almond leaf scorch' OR 'Citrus variegated chlorosis' OR 'Bacterial leaf scorch' OR 'Coffee leaf scorch' OR 'Crespera disease' OR 'Mulberry leaf scorch' OR 'Oleander leaf scorch' OR 'Periwinkle wilt' OR 'Ragweed stunt')
AND
('host* NEAR/2 plant*' OR 'host* NEAR/2 range')

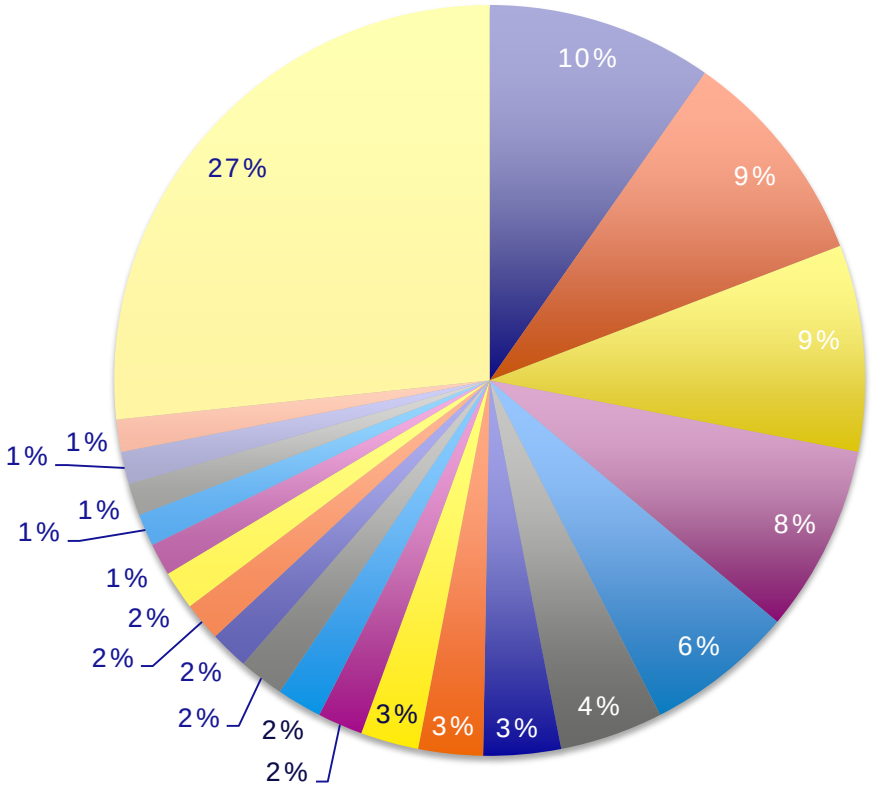
Search Period: from 2013 to 20 November 2015

- 358 references and abstracts collected
- 192 references retained after title and abstract screening
- 110 references retained after full text screening
- 68 papers relevant for data extraction

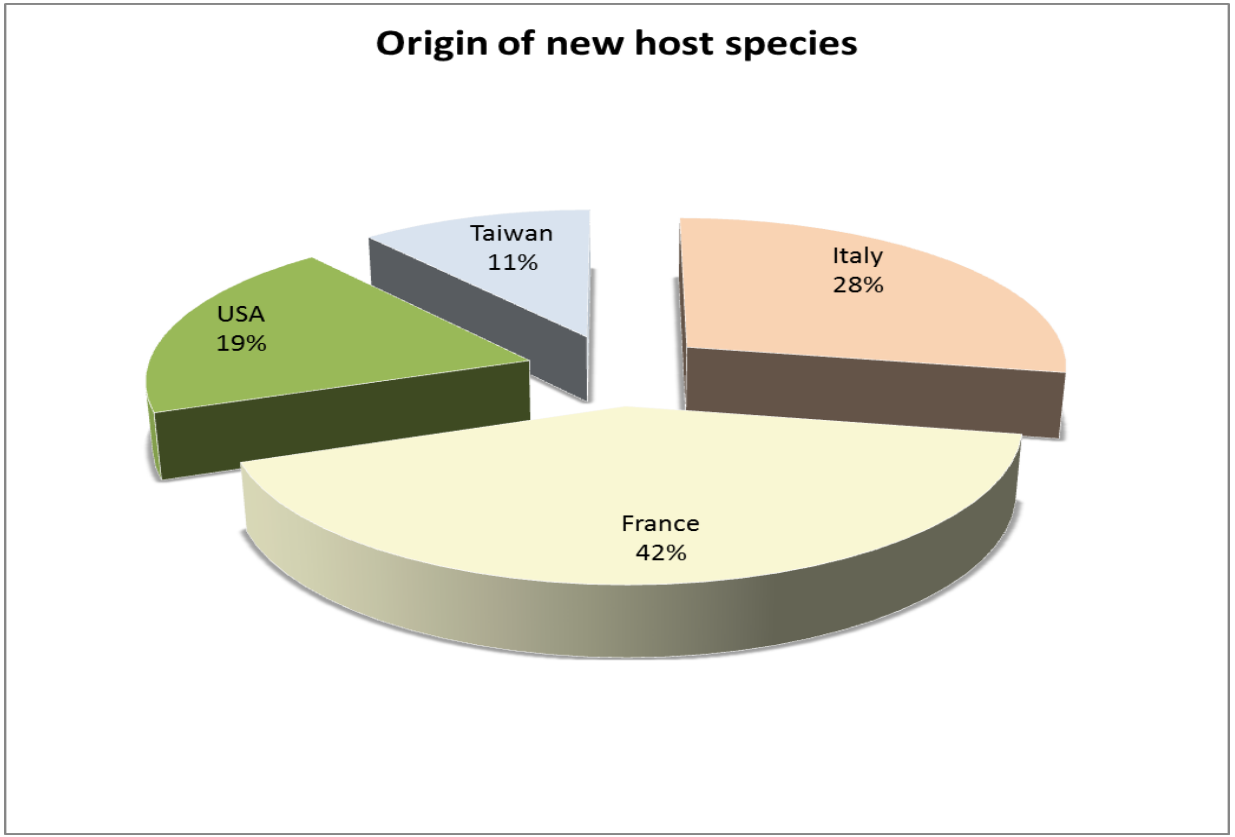
RESULTS (20 NOVEMBER 2015)



RESULTS (20 NOVEMBER 2015)

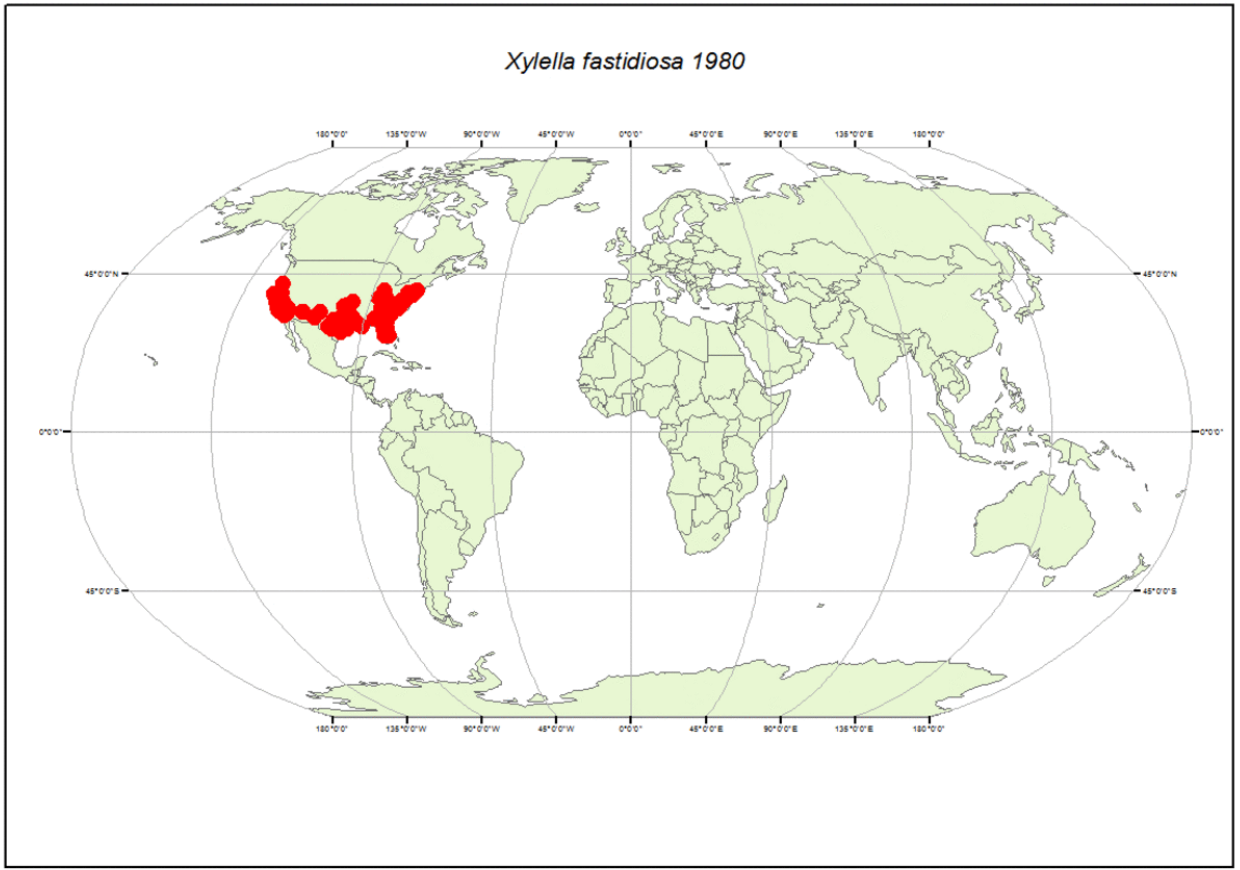


RESULTS OF THE LAST UPDATE (2013 – 2015)

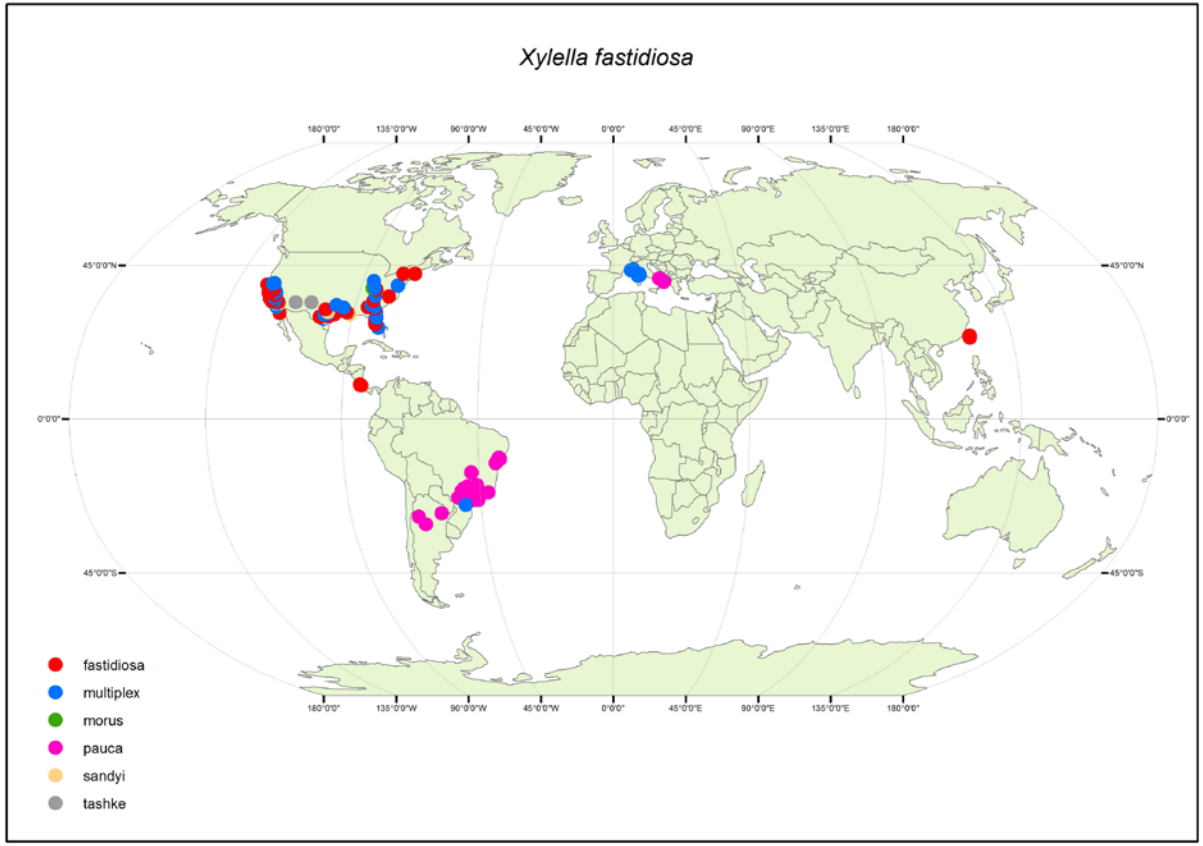


RESULTS

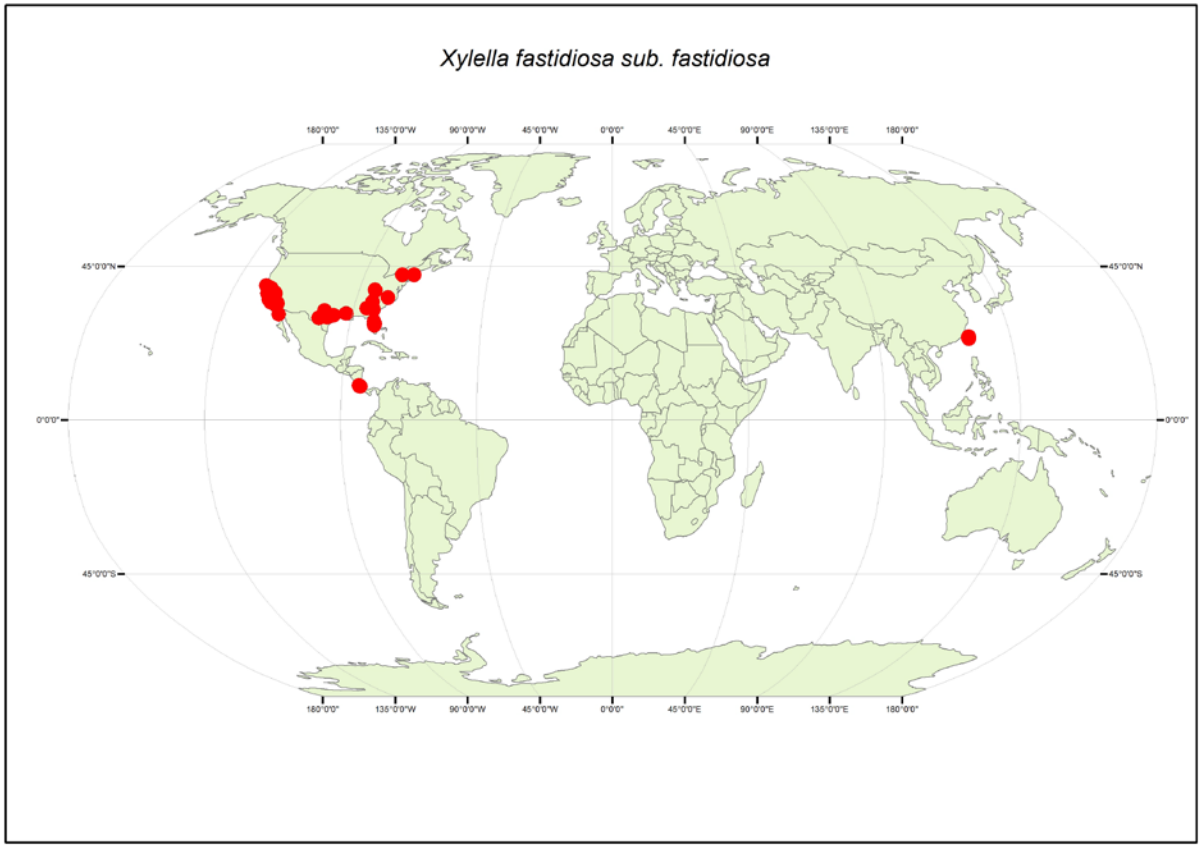
- 359 species (+ 44)
- 204 genera (+ 15)
- 75 families (+ 5)
- New outbreaks:
  - Corsica
  - PACA region



RESULTS


Xylella fastidiosa
fastidiosa
multiplex
morus
pauca
sandyi
tashke

RESULTS

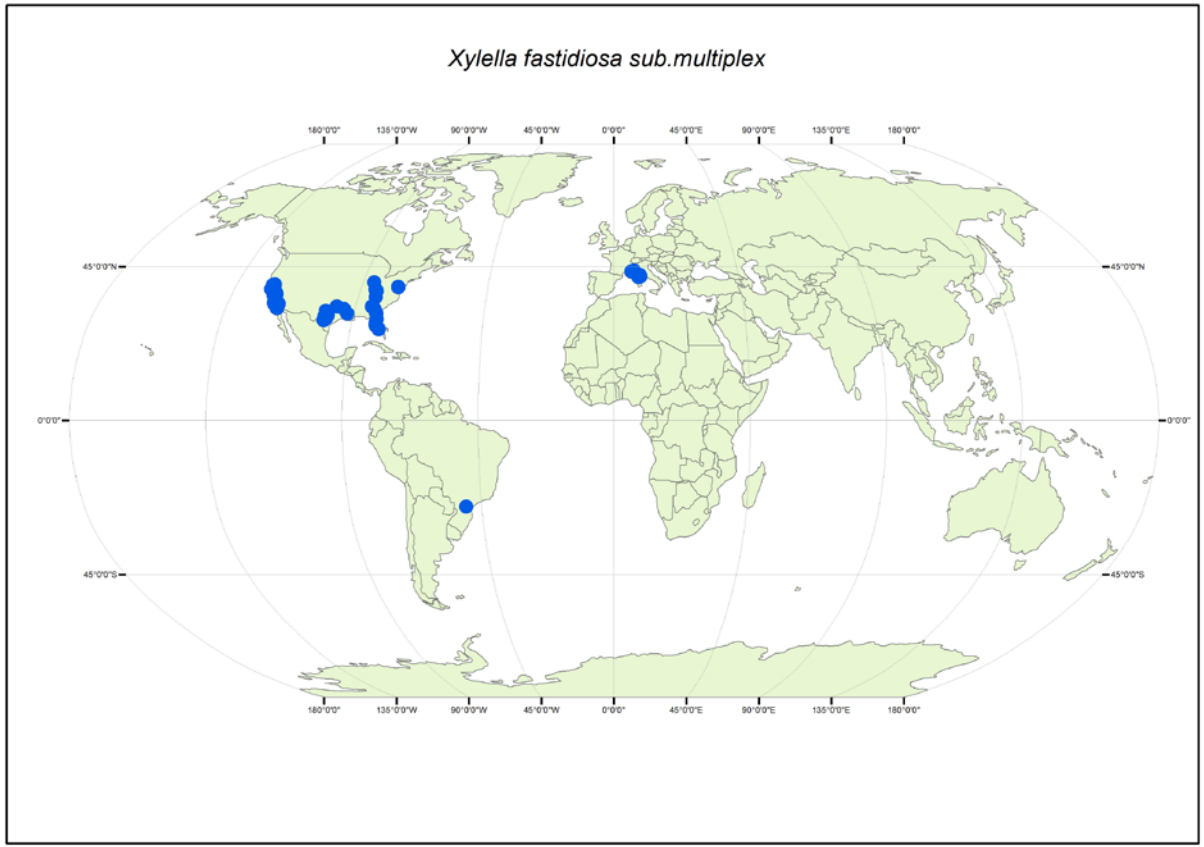


Subspecies *fastidiosa*

Among the hosts we have the following genus

Citrus
Prunus
Vitis

RESULTS

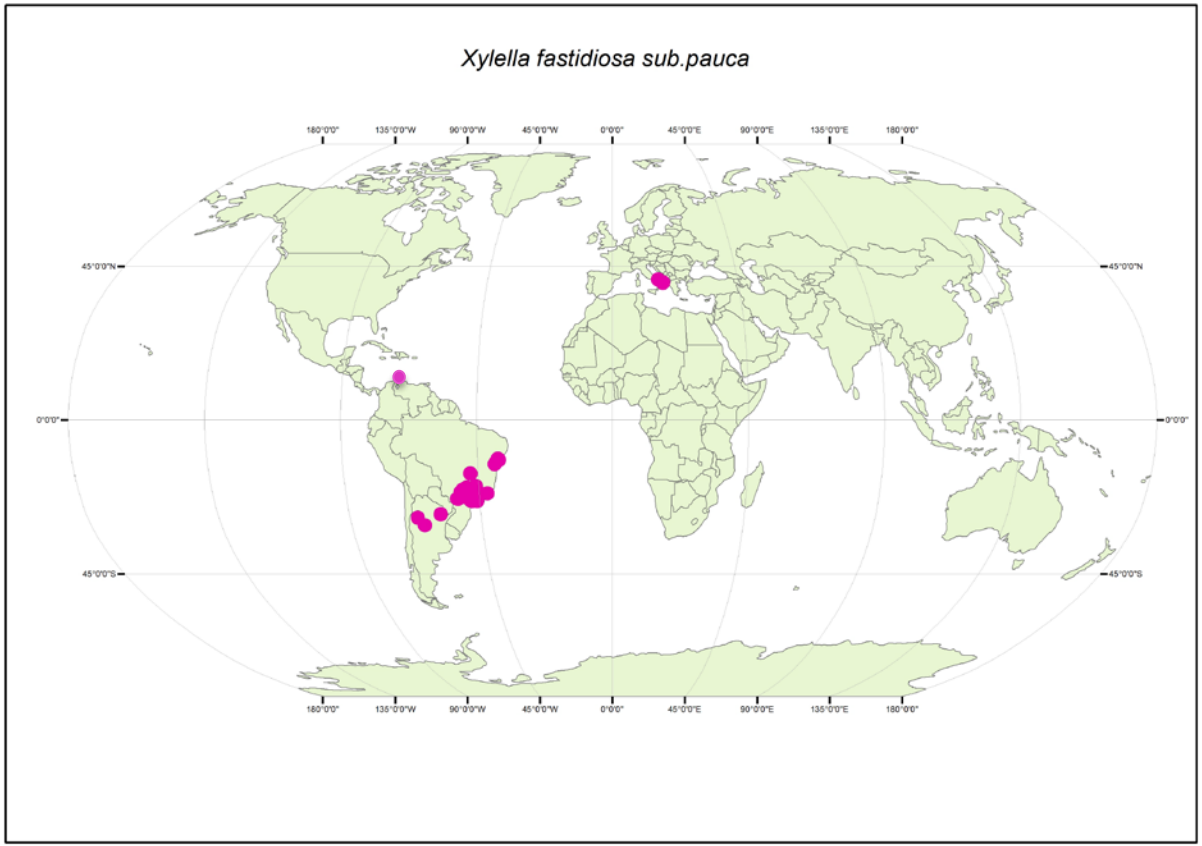


Subspecies *multiplex*

Among the hosts we have

Olea europea
Prunus spp.
Quercus spp.

RESULTS

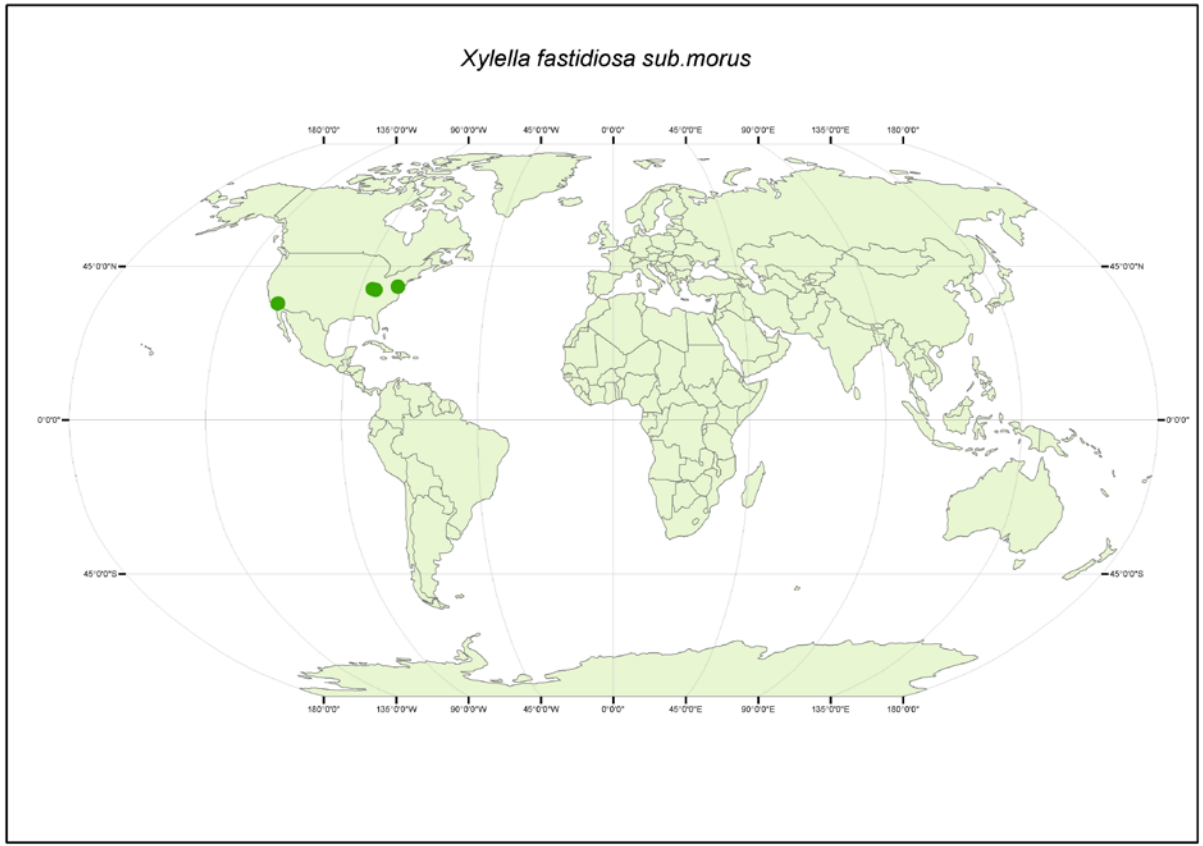


Subspecies *pauca*

Among the hosts we have the following genus

Citrus
Coffea
Olea

RESULTS

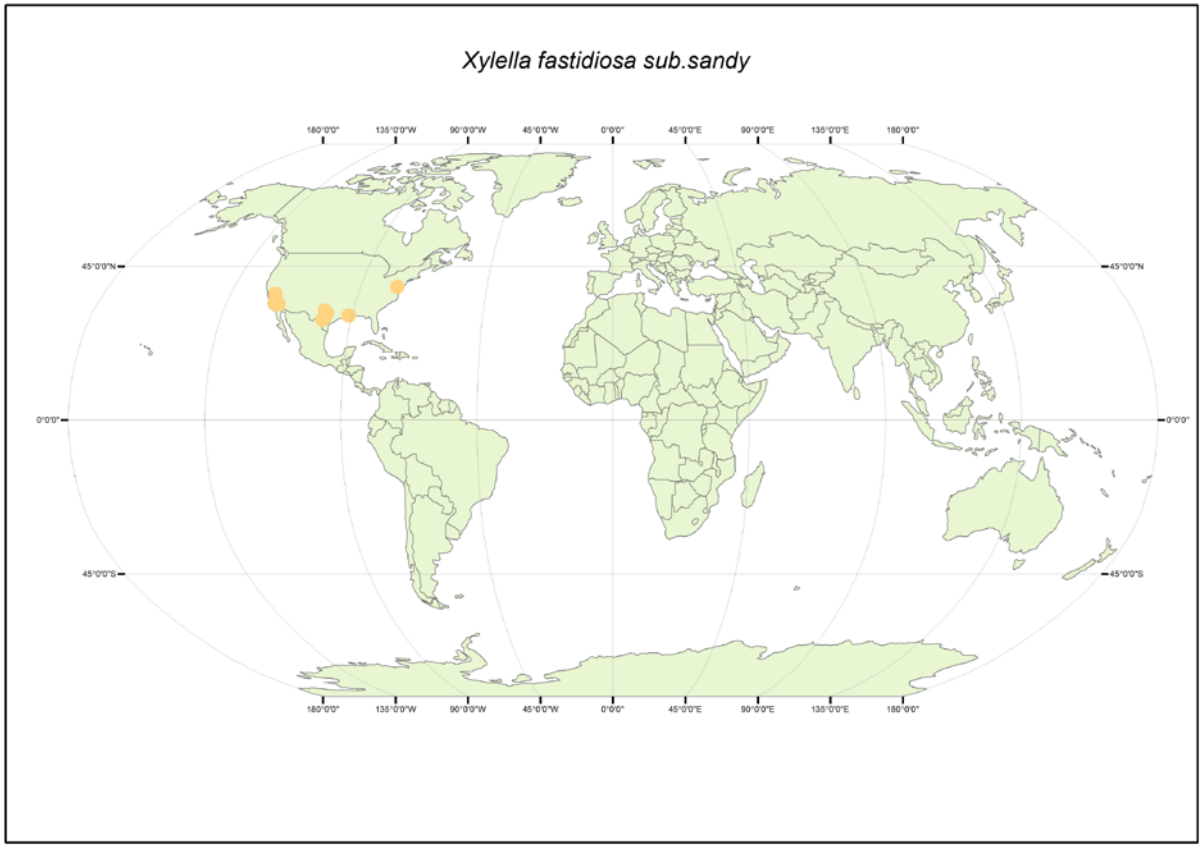


Subspecies *morus*

Among the hosts we have:

Morus alba

RESULTS

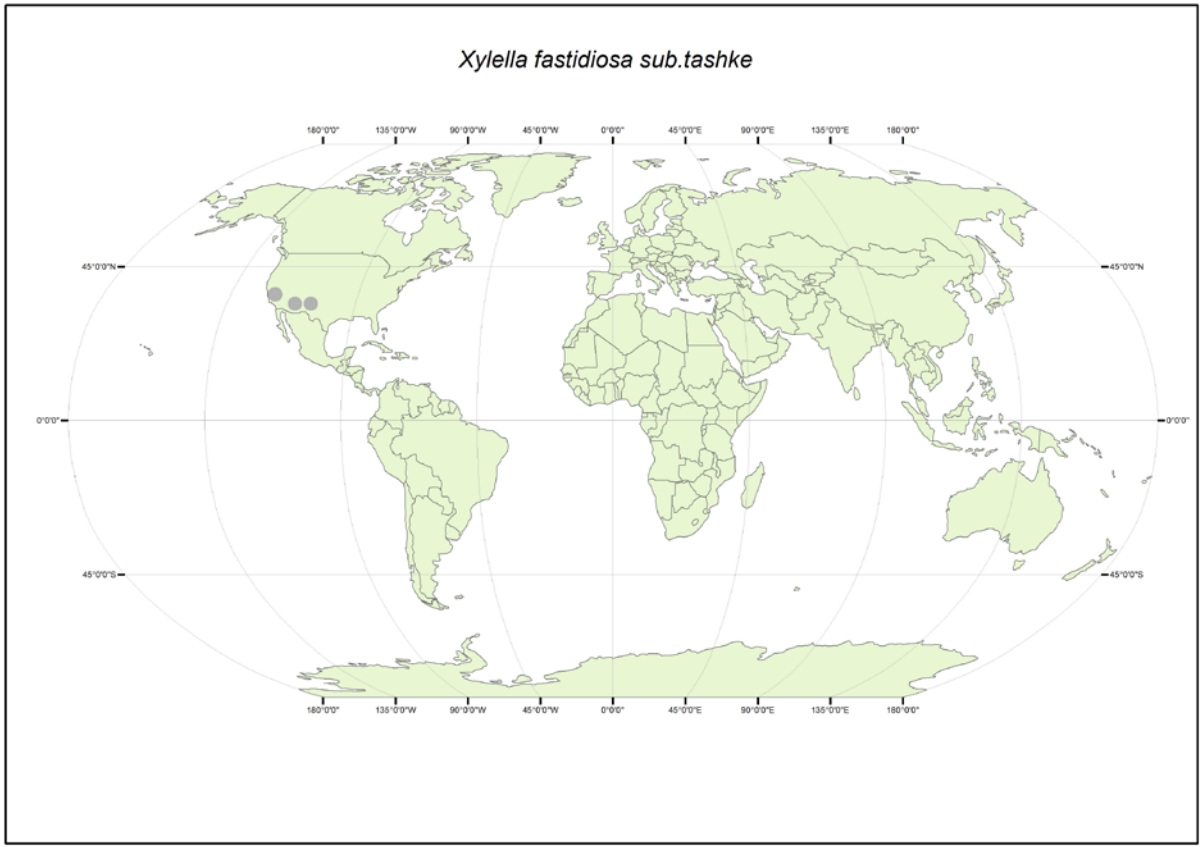


Subspecies *sandy*

Among the hosts we have:

Nerium oleander
Magnolia grandiflora

RESULTS



Subspecies *tashke*

Among the hosts we have

Chitalpa tashketensis

CONCLUSIONS / 1

- Host plants databases are important for research and for regulatory purposes
- Knowledge on the host range of a pest is crucial for all steps of Pest Risk Analysis (Risk Assessment and Risk Management)
- EFSA experience on *Xylella fastidiosa* providing supporting information to risk managers, demonstrated that the inclusion/exclusion of a species can have relevant economical and political implications

CONCLUSIONS / 2

- Especially for microbial pests, numbers and type of detection methods is relevant for the inclusion of a host in the database

- In case of multiple detection methods (i.e. ELISA, PCR, microscopy, etc.) and in presence of contradictory evidences, particular attention should be paid before including a species in the database


THANKS FOR YOUR ATTENTION