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
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
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.
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)

Angiosperms and Gymnosperms families

- 347 families (82%)
- 75 families (18%)

- Non affected
- Xylella affected
RESULTS (20 NOVEMBER 2015)

- Poaceae: 9%
- Fabaceae: 8%
- Rosaceae: 6%
- Asteraceae: 4%
- Fagaceae: 3%
- Vitaceae: 3%
- Sapindaceae: 2%
- Lamiaceae: 2%
- Oleaceae: 2%
- Rubiaceae: 2%
- Rutaceae: 2%
- Solanaceae: 1%
- Apocynaceae: 1%
- Onagraceae: 1%
- Polygonaceae: 1%
- Brassicaceae: 1%
- Geraniaceae: 1%
- Malvaceae: 1%
- Moraceae: 1%
- Moraceae: 1%
- Other: 27%

Origin of new host species

- USA: 19%
- Taiwan: 11%
- Italy: 28%
- France: 42%
RESULTS

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

Xylella fastidiosa

- fastidiosa
- multiplex
- morus
- pauca
- sendyl
- 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
• 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