

Xylella fastidiosa in France



Plant Health Laboratory



Characterisation of *Xylella fastidiosa* strains of coffee

Alert given by positive **ELISA tests** on symptomatic **coffee** plants (2012) in confinement facilities then eradicated



Source : Anses LSV

Chlorotic leaves

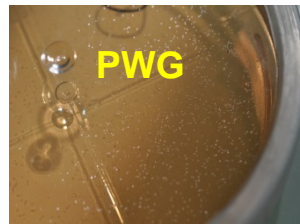
Marginal scorches



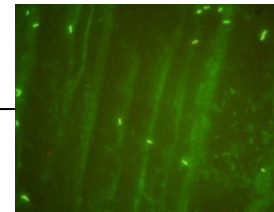
Source : Anses LSV

Processing symptomatic samples in
PBS

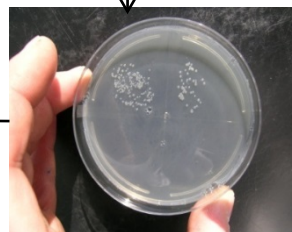
Isolation



Immunofluorescence



PCR (Minsavage *et al.* 1994)
Pooler & Hartung 1995 /
Firrao & Bazzi 1994)
Real Time PCR (Harper *et al.*
2010)



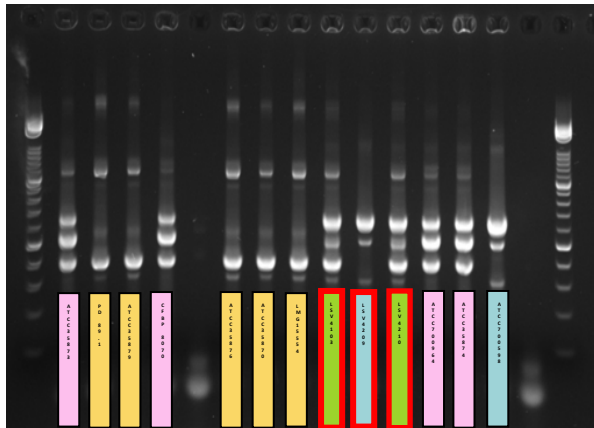
Typical
cells

Typical colonies

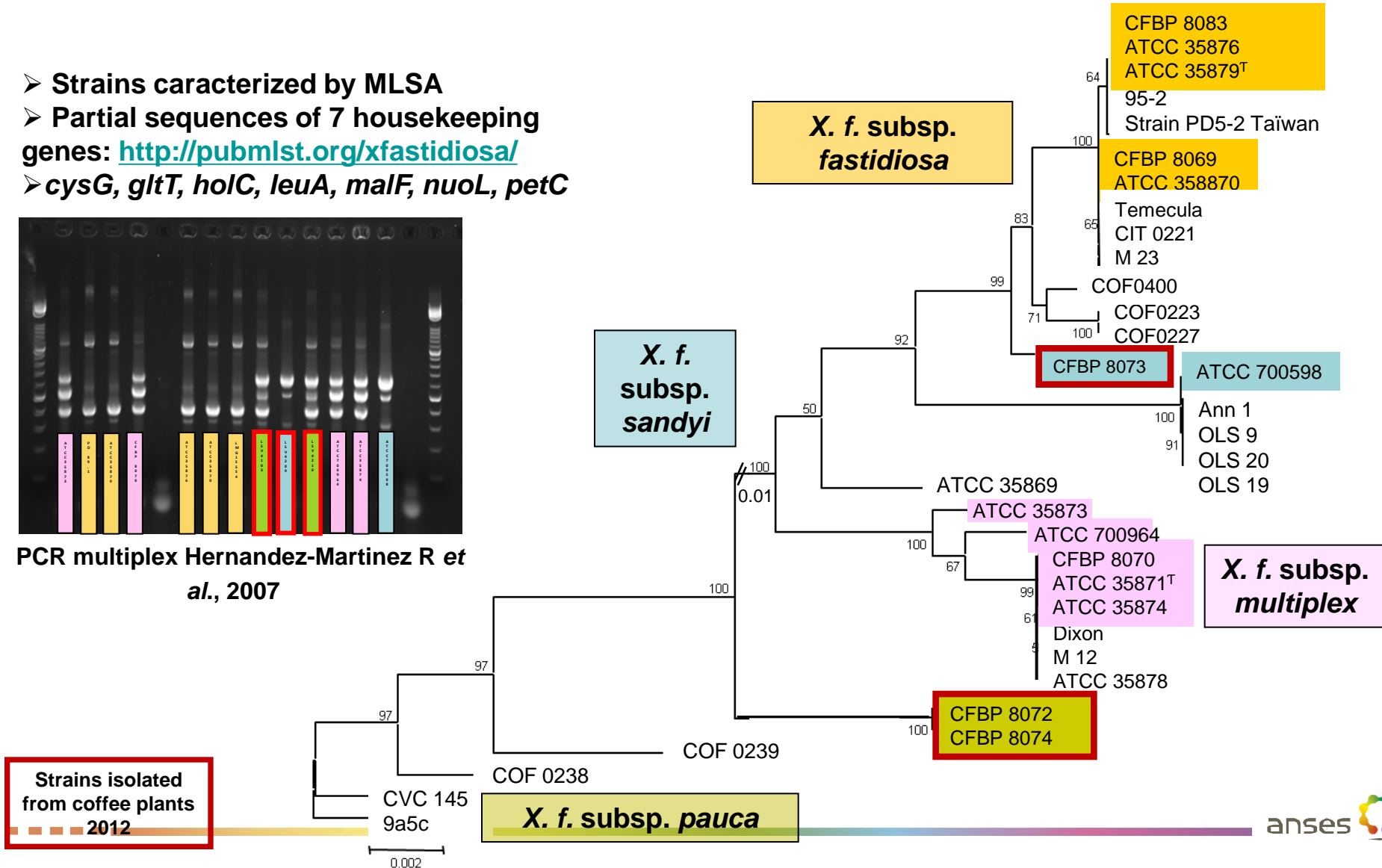
Characterisation of *Xylella fastidiosa* strains of coffee

Phylogenetic concatenated tree (2012)

- Strains characterized by MLSA
- Partial sequences of 7 housekeeping genes: <http://pubmlst.org/xfastidiosa/>
- *cysG*, *gltT*, *holC*, *leuA*, *malF*, *nuoL*, *petC*



PCR multiplex Hernandez-Martinez R et al., 2007



The first alert in Corsica: july 2015



The first alert in Corsica: july 2015



Polygala myrtifolia

Before *Xylella*



After *Xylella fastidiosa*

Immediate emergency plan



In the infected zone : vector treatment, sampling of specified plants, destruction (priority to Polygala and any plant with symptom), no plantation of host plants

In all delimited zone : no circulation of specified plants : in particular, no specified plant for planting goes out the delimited zone (including from nurseries), surveillance



Survey

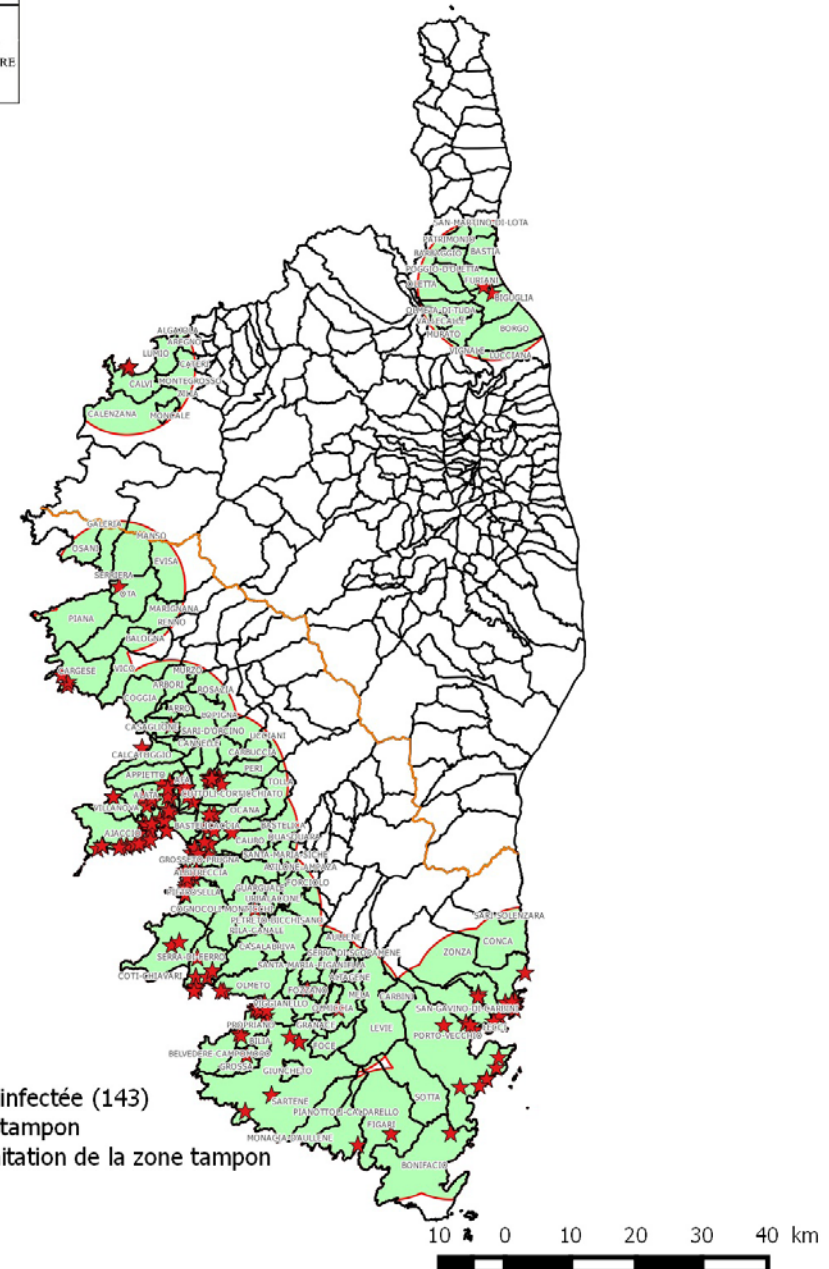


Carte des zones tampons de 10 km autour des zones infectées par *Xylella fastidiosa*.

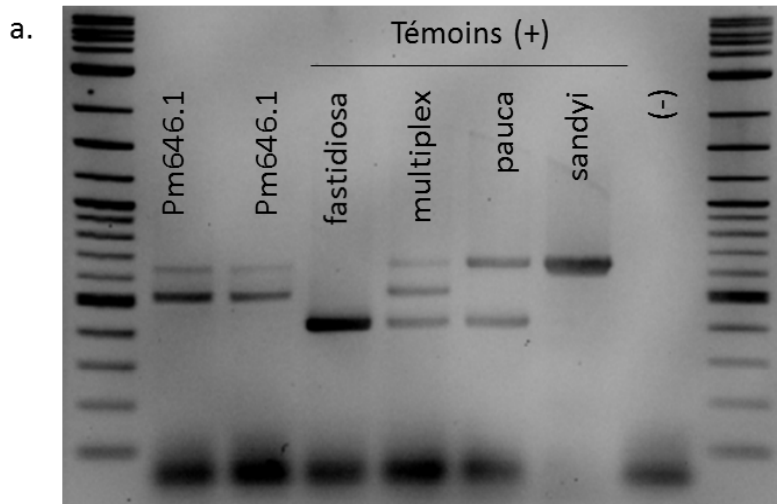
**Samples analysed by rt-PCR
(Harper et al, 2010/2013)**

**January to
15th October 2015**

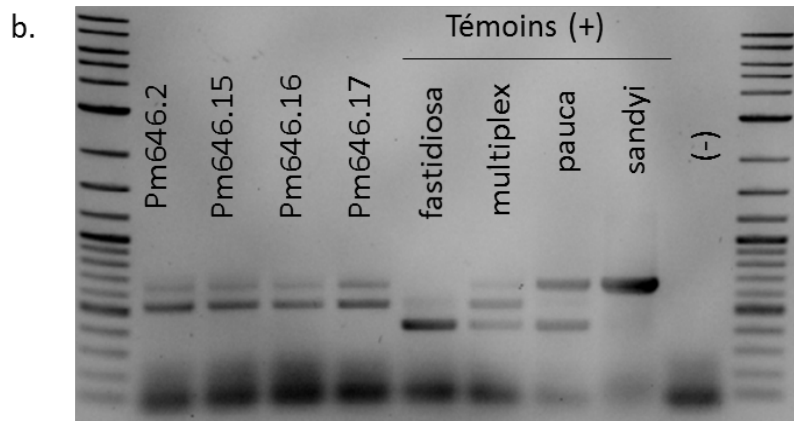
	Samples	% positives
Total France	~ 3700	
Corsica samples	~2500	
<i>Polygala myrtifolia</i>	~1000	29%
<i>Olea europea</i>	~490	0
Oleander	~160	0
Coffee	~130	11%



Identification of the X.f subspecies on corsica samples of *Polygala myrtifolia*



**PCR multiplex Hernandez-Martinez *et al.* (2006):
subsp. *multiplex* (2 types founded)**



- genotype ALSII (Griffin-1) (Chen *et al.*, 1995 - 2013).
- Oak (*Quercus rubra* (OLS), USA (non known on *Vitis*))
- genotype ALSI (Dixon (ST6), M12 (ST7))
- Almond (*Prunus dulcis*), *Olea europaea*, USA

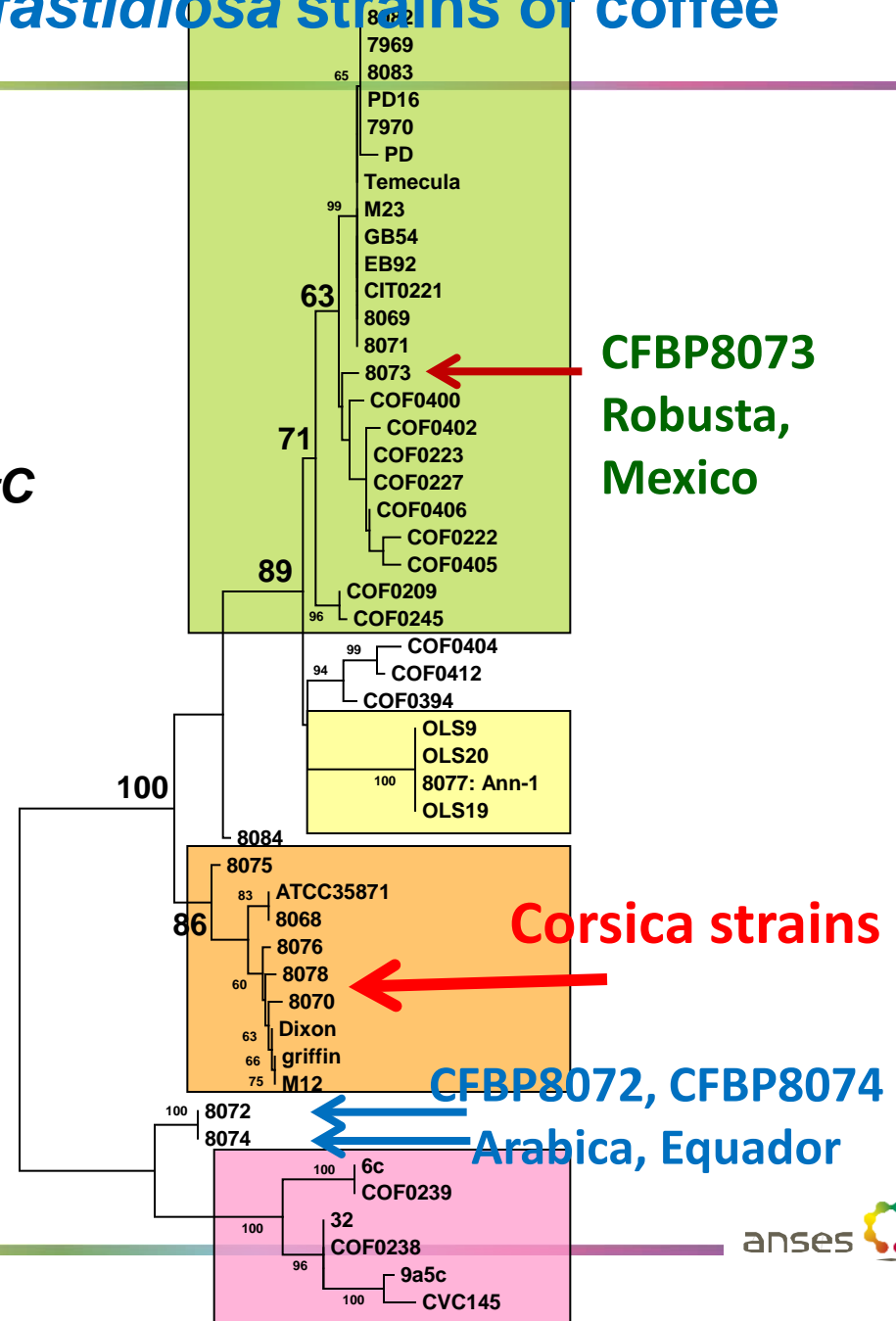
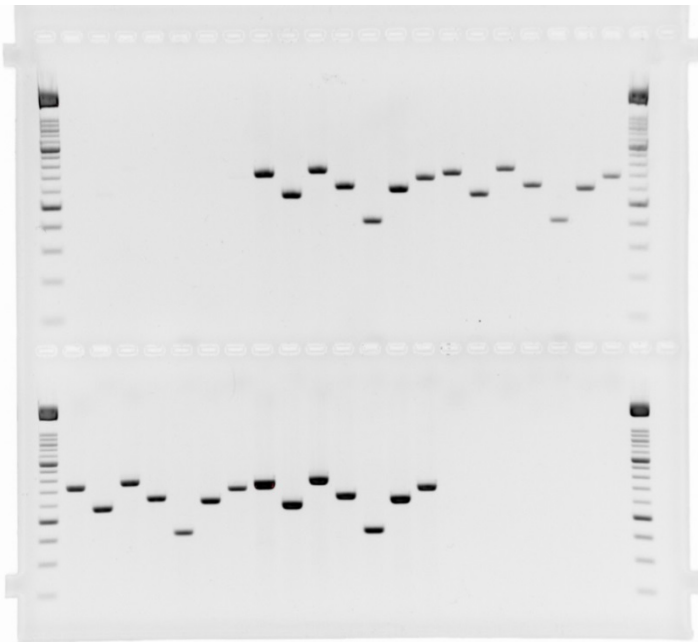
Figure 1. Affiliation par PCR à une sous-espèces de *X. fastidiosa*

Similarity sup 99,5%

Characterisation of *Xylella fastidiosa* strains of coffee

Phylogenetic concatenated tree (2015)

- Characterization by MLSA (MultiLocus Sequence Analysis)
- Partial sequencing of 7 housekeeping genes : <http://pubmlst.org/xfastidiosa/>
- *CysG*, *gltT*, *holC*, *leuA*, *malF*, *nuoL*, *petC*



fastidiosa *sandyi* *multiplex* *pauca*

Progressing host range in Corsica

Polygala myrtifolia

Pelargonium graveolens

Cytisus racemosus

Spartium junceum

Hebe sp.

Lavandula dentata hybride

Cistus creticus

Cistus monspeliensis

Genista ephedroides

Quercus suber

Myrtus communis

Rosmarinus officinalis

Acer pseudoplatanus



Research projects

- Evaluation and validation of detection method (NGS) of Xf on insects in collaboration with INRA
- Evaluation of ddPCR for complex matrices
- Validation of PCR for identification of subsp
- Pathogenicity test on panel of hosts in collaboration with INRA
- EU project H2020 Ponte (2015-2018)



(Photo : Fred CHEVAILLOT – Source : INPN MNHN)

Philaenus spumarius



Green sharpshooter (female),
Draeculacephala minerva,
J. Clark - University of California,
Berkeley (US)

**Thanks to
Anses LSV:**

**Bruno Legendre,
Valérie Olivier,
Stelly Mississippi,
Dimitri Molusson,
Corinne Audusseau,
Christèle Dousset,
Sandrine Paillard,
Christelle François,
Carène Rivoal**



**Thanks to
IRHS-INRA -
Emersys**

**Marie-Agnès
Jacques
Nicolas Denancé**



Thank you for your attention