A web-interface database for the identification of vectors of Xylella fastidiosa in Europe

Jean-Claude Streito, Eric Pierre, Guénaëlle Genson, Maxime Bellifa, Marguerite Chartois, Xavier Mesmin, Pauline Farigoule, Astrid Cruaud, Jean-Yves Rasplus

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Xylella fastidiosa and XF-ACTORS final meeting

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Streito Jean-Claude[1], Pierre Éric[1], Genson Guénaëlle[1], Bellifa Maxime[1], Chartois Marguerite[1], Mesmin Xavier[1], Farigoule Pauline[1,2], Cruaud Astrid[1] & Rasplus Jean-Yves[1]

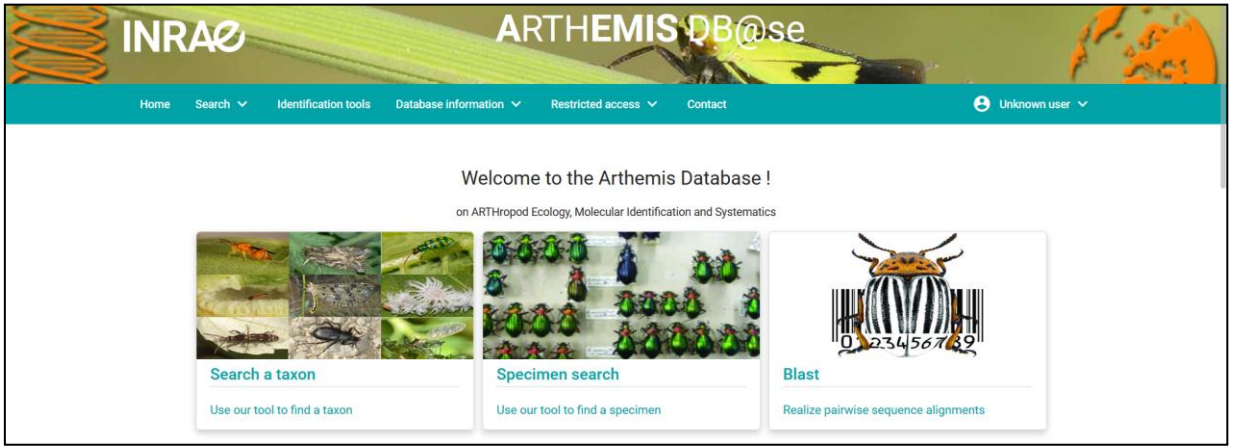
[1]CBGP, INRAE, CIRAD, IRD, Montpellier SupAgro, Univ. Montpellier, Montferrier-sur-Lez, France (jean-claude.streito@inrae.fr); [2]AgroParisTech, Paris, France

INTRODUCTION

- Identification of vectors of *Xylella fastidiosa* (Xf) based on morphological characters can be difficult and sometimes impossible (eggs, nymphs).

- **We have developed a web-interface database of *COI* barcode.**

https://arthemisdb.supagro.inra.fr/

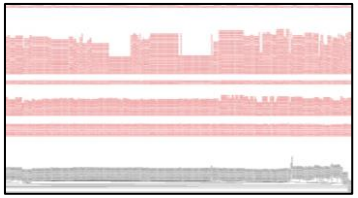


MATERIALS & METHODS

Sequencing

- Sequences generated with a high-throughput approach involving two PCR steps to target *COI* and index samples followed by Illumina sequencing.

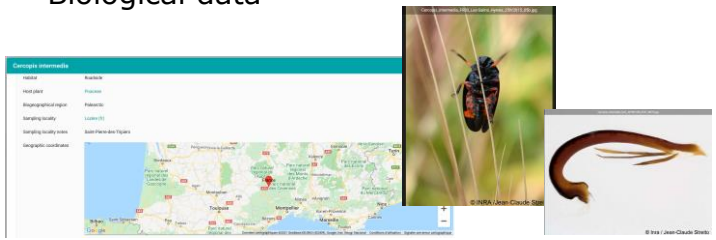
Two-step PCR and Miseq sequencing



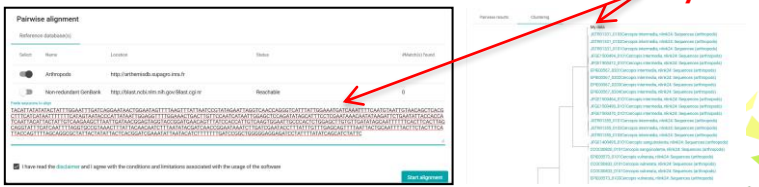
- Quality controls: i) non-destructive DNA extraction, vouchering and morphological re-examination by taxonomists; ii) bioinformatic controls to detect possible contaminants, PCR/sequencing errors, introgressions, NUMTs and heteroplasms.

Data provided online

- Sequences : *COI* standards barcodes (Hebert et al., 2003)
- Metadata associated with records
- Pictures including habitus and genitalia
- Biological data



- Identification of a query sequence through BLAST comparison against our reference library.

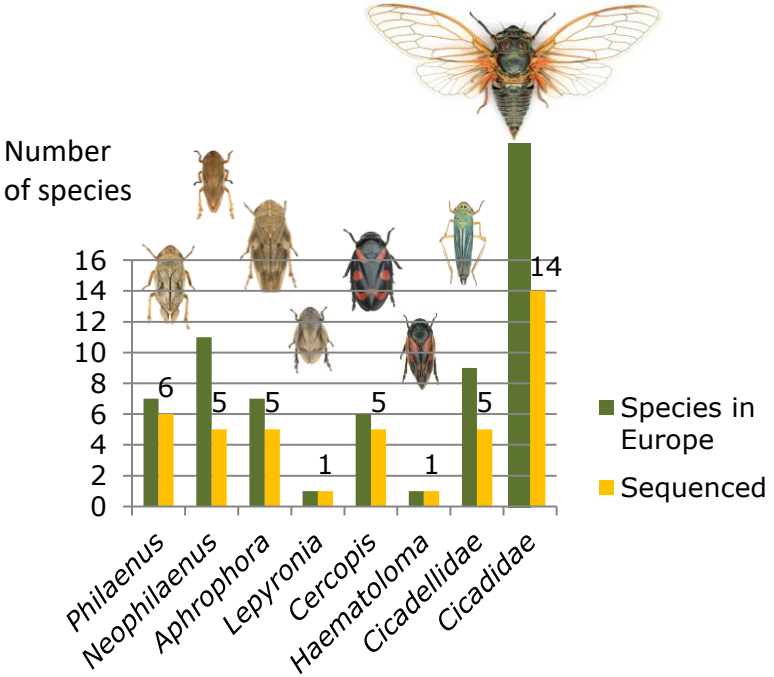


RESULTS

Database contents

- 681 barcodes sequences
- 74 species of potential vectors of Xf
- 536 sequences representing 42 European species
- 145 sequences representing 32 non-European species.
- All frequent species have been barcoded. Missing species do not represent an important threat for European agriculture.

Database completion



ISSUES AND CONCLUSION

Can we rely on DNA barcoding and morphology to identify vectors of Xf ?

- *COI* allows reliable identification for 80% of the species, but we observed issues for the remaining 20%.
- *Philaenus spumarius* and *P. tesselatus* share the same COI but are also hardly distinguishable morphologically => possible synonyms ?
- It was also difficult to cross validate morphological and molecular results for some species within the genera *Neophilaenus* and *Aphrophora?*

Identification of most of the vectors of Xf in Europe is possible using morphological characters and DNA barcoding.
But more work has to be conducted to clarify the taxonomic status of some species