



Comparative Genomics of Pathogenic and Nonpathogenic Strains of *Xanthomonas arboricola* Unveil Molecular and Evolutionary Events Linked to Pathoadaptation

Submitted by Tristan Boureau on Mon, 09/10/2018 - 16:08

Titre	Comparative Genomics of Pathogenic and Nonpathogenic Strains of <i>Xanthomonas arboricola</i> Unveil Molecular and Evolutionary Events Linked to Pathoadaptation
Type de publication	Article de revue
Auteur	Cesbron, Sophie [1], Briand, Martial [2], Essakhi, Salwa [3], Gironde, Sophie [4], Boureau, Tristan [5], Manceau, Charles [6], Fischer-Le Saux, Marion [7], Jacques, Marie-Agnès [8]
Editeur	Frontiers Media
Type	Article scientifique dans une revue à comité de lecture
Année	2015
Langue	Anglais
Date	22 Décembre 2015
Numéro	431
Volume	6
Section	1126
Titre de la revue	Frontiers in Plant Science
ISSN	1664-462X
Mots-clés	bacterial blight [9], copper resistance [10], ICE [11], <i>Juglans regia</i> [12], Secretion system [13], vertical oozing canker [14]

Résumé en
anglais

The bacterial species *Xanthomonas arboricola* contains plant pathogenic and nonpathogenic strains. It includes the pathogen *X. arboricola* pv. *juglandis*, causing the bacterial blight of *Juglans regia*. The emergence of a new bacterial disease of *J. regia* in France called vertical oozing canker (VOC) was previously described and the causal agent was identified as a distinct genetic lineage within the pathovar. Symptoms on walnut leaves and fruits are similar to those of a bacterial blight but VOC includes also cankers on trunk and branches. In this work, we used comparative genomics and physiological tests to detect differences between four *X. arboricola* strains isolated from walnut tree: strain CFBP 2528 causing walnut blight (WB), strain CFBP 7179 causing VOC and two nonpathogenic strains, CFBP 7634 and CFBP 7651, isolated from healthy walnut buds. Whole genome sequence comparisons revealed that pathogenic strains possess a larger and wider range of mobile genetic elements than nonpathogenic strains. One pathogenic strain, CFBP 7179, possessed a specific integrative and conjugative element (ICE) of 95 kb encoding genes involved in copper resistance, transport and regulation. The type three effector repertoire was larger in pathogenic strains than in nonpathogenic strains. Moreover, CFBP 7634 strain lacked the type three secretion system encoding genes. The flagellar system appeared incomplete and nonfunctional in the pathogenic strain CFBP 2528. Differential sets of chemoreceptor and different repertoires of genes coding adhesins were identified between pathogenic and nonpathogenic strains. Besides these differences, some strain-specific differences were also observed. Altogether, this study provides valuable insights to highlight the mechanisms involved in ecology, environment perception, plant adhesion and interaction, leading to the emergence of new strains in a dynamic environment.

URL de la
notice

<http://okina.univ-angers.fr/publications/ua17526> [15]

DOI

10.3389/fpls.2015.01126 [16]

Lien vers le
document

<https://www.frontiersin.org/articles/10.3389/fpls.2015.01126/full> [17]

Titre abrégé Front. Plant Sci.

Liens

- [1] <http://okina.univ-angers.fr/sophie.cesbron/publications>
- [2] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=12672>
- [3] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=29065>
- [4] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=12999>
- [5] <http://okina.univ-angers.fr/t.boureau/publications>
- [6] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=7512>
- [7] <http://okina.univ-angers.fr/m.fischer/publications>
- [8] <http://okina.univ-angers.fr/m.jacques/publications>
- [9] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=25293>
- [10] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=25295>
- [11] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=25294>
- [12] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=12035>
- [13] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=12232>
- [14] <http://okina.univ-angers.fr/publications?f%5Bkeyword%5D=25292>
- [15] <http://okina.univ-angers.fr/publications/ua17526>
- [16] <http://dx.doi.org/10.3389/fpls.2015.01126>
- [17] <https://www.frontiersin.org/articles/10.3389/fpls.2015.01126/full>