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► **To cite this version:**

J Fischer, F Fontaine, E Thines. Pathogen-Host Interaction Analysis of Esca-associated fungal mutant strains. 10th IWGTD, 2017, REIMS, France. hal-03124115

**HAL Id: hal-03124115**

**<https://hal.univ-reims.fr/hal-03124115v1>**

Submitted on 28 Jan 2021

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# Pathogen-Host Interaction

## Analysis of Esca-associated fungal mutant strains

J. Fischer<sup>1</sup>, F. Fontaine<sup>3</sup> and E. Thines<sup>1,2</sup>

1 Institut für Biotechnologie und Wirkstoff-Forschung gGmbH, Erwin-Schrödinger-Straße 56, 67663 Kaiserslautern  
 2 Mikrobiologie und Weinforschung am Institut für Molekulare Physiologie, Johann-Joachim-Becherweg 15, Johannes-Gutenberg Universität, 55128 Mainz  
 3 In association with Florence Fontaine and the University of Reims Champagne-Ardenne - Faculty of Exact and Natural Sciences, Research Unit on Grapevine and Wines in Champagne – EA 4707, Institut Georges Chappaz de la vigne et du vin en Champagne

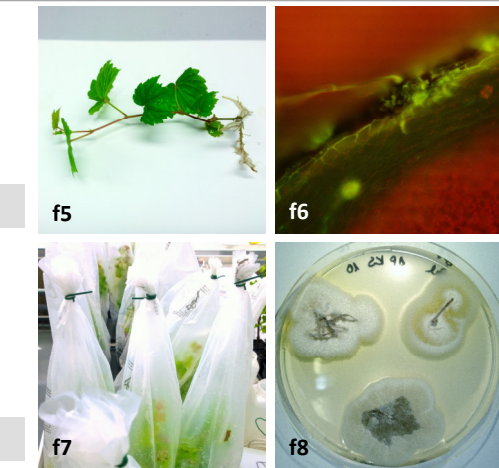
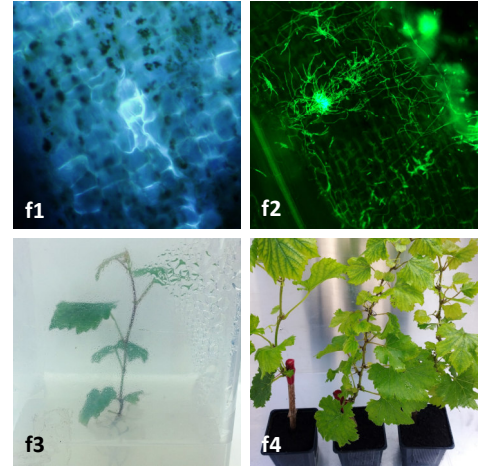


### Introduction:

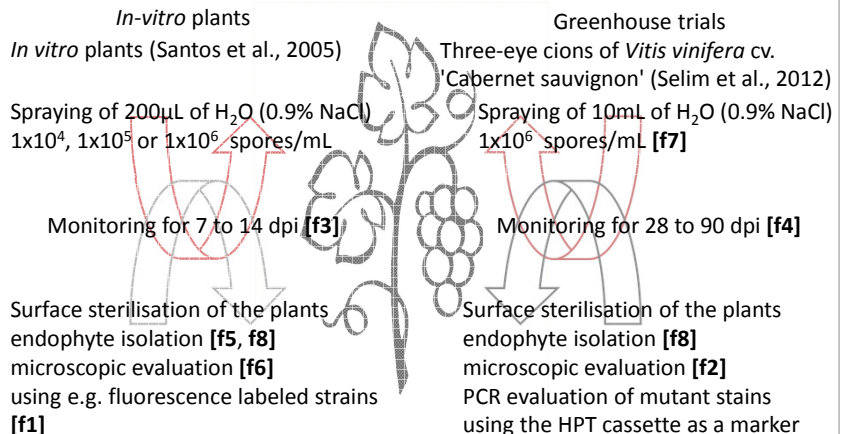
Esca is well known in the Mediterranean region and Western Europe as a destructive disease of grapevine caused by fungal pathogens showing severe symptoms on grapevine plants. Mainly *Phaeoemoniella chlamydospora* (Pch) and *Phaeoacremonium minimum* (Pmi) growing as endophytes are involved (Fischer, 2015).

Despite the efforts made by the scientific community in the last decade, the symptom formation and the cause of those leaf symptoms is still poorly understood. In general the involvement and phytotoxic activity of the secondary metabolites scytalone and isosclerone produced by the pathogens is assumed (Andolfi et al., 2006).

During the study the ability of several gen-deletion mutants of Esca-associated fungi (namely Pch and Pmi) to infect grapevine cuttings as well as *in-vitro* plants was analyzed. The previously generated mutants show a higher sensitivity to artificial stresses, such as heat or osmotic stress, than the wild type strains. Furthermore, they have a strongly reduced melanin biosynthesis because of the lack of essential enzymes (polyketide synthases, PKS) of the scytalone biosynthesis pathway. These infection assays may help to understand the host-pathogen-interaction on a molecular level.



### Material and Methods:

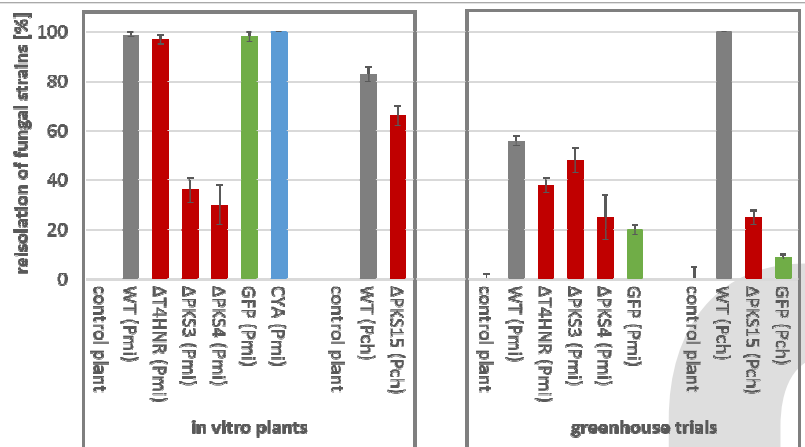


### Results:

The results [f9] indicate that all plants tested were free of Pch and Pmi before the artificial infection assay. Furthermore, it was observed, that the WT strains and the fluorescence labeled strains had the highest infection rate in both test systems, whereas the  $\Delta$ PKS strains of both fungi had the lowest reisolation rate throughout the tests. And finally, the infection rate and reisolation efforts were much lower for the greenhouse plants compared to the *in vitro* approach.

### Conclusions:

The impact on the infection success of the  $\Delta$ PKS-mutant strains was somehow surprising since the deletion of the Tetrahydroxynaphthalene reductase ( $\Delta$ T4HNR) had little to no impact on the mutants. In the future an assay that allows a monitoring of occurring symptoms due to the infection of WT and mutant strains would be a preferable research aim.



F9: results of the conducted greenhouse and *in vitro* plant trials

### References:

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### Acknowledgements:

The contributions to this work by Matthias Adams (FH Birkenfeld), Sabine Schwarz (Technical University Berlin), Petra Stark (IBWF) and Anja Schöffler (IBWF) are gratefully acknowledged. Furthermore we would like to thank the University of Reims Champagne-Ardenne (Institut Georges Chappaz de la vigne et du vin en Champagne) and the COST European cooperation in science and technology (FA1303) for their financial support.



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