



HAL
open science

Botrytis pseudocinerea is resistant to the fungicide fenhexamid due to detoxification by the cytochrome P450 monooxygenase CYP684

Saad Azeddine, Alexis A. Billard, Jocelyne Bach, Catherine Lanen, Anne Sophie A. S. Walker, Danièle D. Debieu, Sabine, Helma Fillinger-David

► To cite this version:

Saad Azeddine, Alexis A. Billard, Jocelyne Bach, Catherine Lanen, Anne Sophie A. S. Walker, et al.. Botrytis pseudocinerea is resistant to the fungicide fenhexamid due to detoxification by the cytochrome P450 monooxygenase CYP684. Proceedings of the 17th International Reinhardtsbrunn symposium on Modern Fungicides and Antifungal Compounds,, Apr 2013, Friedrichroda, Germany. 2013. hal-01189690

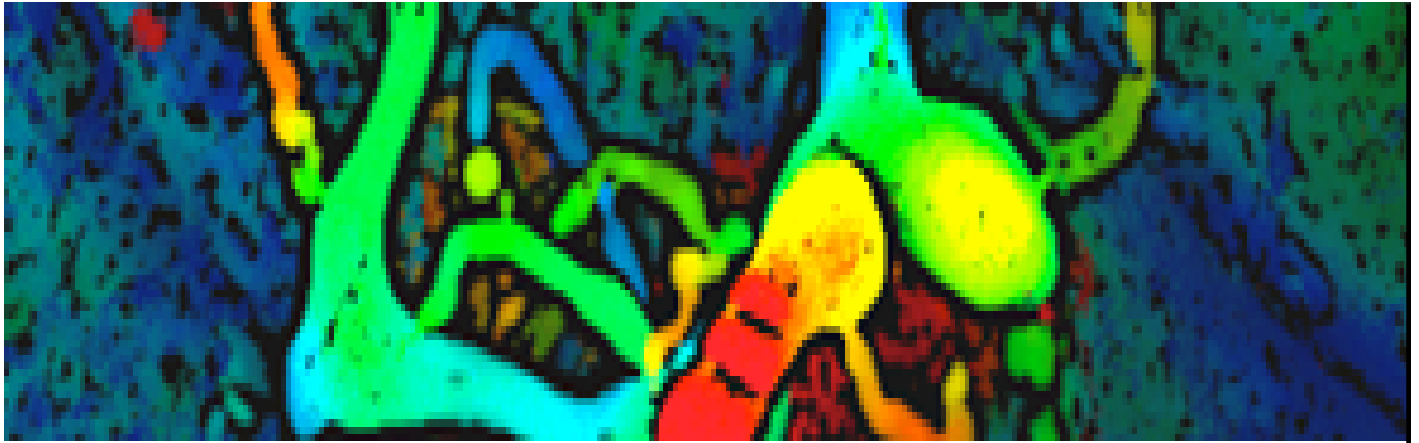
HAL Id: hal-01189690

<https://hal.science/hal-01189690>

Submitted on 3 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



**17th International
Reinhardtsbrunn Symposium**
on
Modern Fungicides and
Antifungal Compounds

Scientific Program

Sunday, April 21st

16:00-19:30 Registration

20:00-22:00 Welcome Reception

Ramada-Hotel, Friedrichroda

April 21st –April 25th, 2013

Monday, April 22, 2013

08:30	Opening - Prof. Dr. Heinz-Wilhelm Dehne
-------	---

Introduction Lectures - Chair: Prof. Holger Deising

08:40	Prof. Michael Shaw University of Reading, UK	<i>Keynote:</i> Changing priorities in crop disease management
09:10	Prof. James Adaskaveg University of Riverside, USA	<i>Keynote:</i> Improving distribution of fruits and vegetables by postharvest decay control using new 'reduced-risk' fungicides
09:40	Dr. Pete Berry ADAS Ltd, UK	<i>Keynote:</i> Ecological benefits of fungicides
10:10	Dr. Frank Sauer Lanxess, D	<i>Keynote:</i> Industrial use of fungicides
10:40	Coffee	

New Technologies and Applications - Chair: Dr. Bart Fraaije

11:00	Prof. Holger Deising University of Halle, D	<i>Keynote:</i> Discovery of candidate genes for defeating fungal pathogens by host-induced gene silencing (HIGS)
11:30	Dr. P. Schweizer IPK, Gatersleben, D	<i>Keynote:</i> RNAi Technology for durable resistance of crop plants to fungal pathogens
12:00	Mrs. Aline Koch University of Gießen, D	HIGS for the control of agronomical important fungal plant pathogens
12:20	Mr. Carlos Berdugo University of Bonn, D	Non-invasive sensor for screening effects of fungicides on plant senescence
12:40	Lunch	

New Modes of Action and Fungicides - Chair: Dr. Dietrich Hermann

14:00	Mr. James Sweigard DuPont Crop Protection, USA	Discovery of the target site of isoxazoline fungicides
14:20	Dr. Adele Salamone CRA-SFM, IT	Efficacy of the fungicide valiphenal against crown rot of rose caused by <i>Phytophthora citrophthora</i>
14:40	Dr. Friedrich Kerz-Möhlendick Bayer CropScience AG, D	Penflufen: The innovative fungicide for seed treatment uses in broad-acre crops
15:00	Mr. Eric Guicherit Syngenta Crop Protection, CH	Solatenol™, the second generation benzonorbornene SDHI carboxamide with outstanding performance against cereal diseases
15:20	Mr. Jonathan Cray Queen's University Belfast, UK	Chaotropic & hydrophobic stress-mechanisms of antifungal substances
15:40	Dr. Christoph Braun Bayer CropScience AG, D	Trigger off endogenous plant defences by isotianil, a new resistance inducer
16:00	Coffee	
16:20-18:00	Poster Demonstration I	-New Modes of Action and Fungicides -New Technologies and Applications -Resistance Risk Assessment -Complex II Inhibitors - Mode of Action and Resistance -Fungicide Resistance - Molecular Aspects, Diagnostics and Genetics

Tuesday, April 23, 2013

Fungicide Resistance - Molecular Aspects, Diagnostics and Genetics - Chair: Prof. Ulrich Gisi

08:30	Dr. Andreas Mosbach Syngenta Crop Protection, CH	Approaches to decipher fungicide resistance mechanisms against new active ingredients in the plant pathogenic fungus <i>Botrytis cinerea</i>
08:50	Dr. Nichola Hawkins Rothamsted Research, UK	The role of multiple cyp51 paralogues in intrinsic and acquired azole sensitivity differences
09:10	Dr. Hans Cools Rothamsted Research, UK	Impact of cyp51 changes associated with azole resistance in fungal pathogens of arable crops
09:30	Mrs. Carolina Buitrago Syngenta Crop Protection, CH	An update of the genetic changes in the cytochrome p450 sterol 14-demethylase gene (cyp51) of <i>Mycosphaerella graminicola</i> and their relationship with the DMI fungicides sensitivity
09:50	Dr. Sabine Fillinger INRA, F	Characterization of molecular mechanisms underlying the multi-drug-resistant phenotypes of <i>Mycosphaerella graminicola</i> field isolates
10:10	Coffee	
10:30	Dr. Stefan Wirsal University of Halle, D	Contribution of abc transporters to azole resistance and virulence in <i>Fusarium graminearum</i>
10:50	Mrs. Helena Schmitz University of Hohenheim, D	Sensitivity of <i>Phakopsora pachyrhizi</i> to fungicides and analysis of corresponding resistance mechanisms
11:10	Mrs. Madeline Tucker ACNFP, Curtin University, AUS	The impact of recently emerged mutations in cyp51 in <i>Blumeria graminis</i> f. sp. <i>hordei</i> isolates in western Australia
11:30	Mr. Pablo Chong Wageningen University and Research, NL	Azole fungicide resistance in <i>Mycosphaerella fijiensis</i> populations from Central and South America
11:50	Prof. Matthias Hahn University of Kaiserslautern, D	High frequency occurrence of multiple fungicide resistance and of a novel taxonomic clade of <i>Botrytis</i> spp. in German strawberry fields
12:10	Prof. Richard Oliver ACNFP, Curtin University, AUS	Exploring the molecular basis underlying fungicide resistance in <i>Botrytis</i> spp. infecting pulses in Australia
12:30	Lunch	
14:00-22:00	Excursion	

Wednesday, April 24, 2013

Resistance Risk Assessment - Chair: Dr. Andreas Mehl

09:00	Dr. Neil Paveley ADAS, UK	<i>Keynote:</i> Improving the predictive power of resistance risk assessment
09:30	Mrs. Hilda Dooley Teagasc, IRL	Slowing the increase in fungicide resistance – does rate or type of application matter?
09:50	Dr. Peter Hobbelen Rothamsted Research, UK	The usefulness of mixing two fungicides as a resistance management strategy: a modelling analysis
10:10	Dr. Alexey Mikaberidze ETH Zürich, CH	When do fungicide mixtures select for fungicide resistance?
10:30	Coffee	
10:50	Dr. Bart Fraaije Rothamsted Research, UK	The use of azole and SDHI fungicides to control Septoria leaf blotch in the UK
11:10	Mrs. Anne-Sophie Walker INRA, BIOGER-CPP, F	Habitat- and host-specific differentiation in the multihost fungal pathogen <i>Botryotinia fuckeliana</i> and evidence for fungicide selection in populations
11:30	Prof. Louise May de Mio Universidade Federal do Paraná, BR	Tebuconazole and thiophanate-methyl fungicides resistance assessment of <i>Monilinia</i> species from South Brazil peach orchards
11:50	Dr. Gerd Stammler BASF SE, D	Resistance management of metrafenone in powdery mildews
12:10	Lunch	
13:30	Dr. Heiko Feldmann DPG, D	Instructions for the <i>Proceedings of the 17th International Reinhardsbrunn Symposium on Modern Fungicides and Antifungal Compounds</i>

Complex II Inhibitors - Mode of Action and Resistance - Chair: Dr. Gerd Stammler

13:50	Dr. Martin Semar BASF SE, D	Impact of mutations in the <i>sdh</i> gene on the sensitivity to different SDHIs in various pathogens
14:10	Mrs. Anne-Sophie Walker INRA, BIOGER-CPP, F	From enzyme to fungal development or how <i>sdhB</i> mutations impact respiration, fungicide resistance and fitness in the grey mold agent <i>Botrytis cinerea</i>
14:30	Mrs. Marta Piotrowska Scotland's Rural College (SRUC), UK	<i>Ramularia collo-cygni</i> - studying its potential fungicide resistance to <i>sdhis</i>
14:50	Dr. George Karaoglanidis Aristotelian University, GR	Fitness and competitive ability of <i>Botrytis cinerea</i> field isolates resistant to SDHI fungicides possessing different <i>sdhB</i> mutations
15:10	Coffee	

Natural Antifungal Compounds - Chair: Dr. Erich-C. Oerke

15:30	Dr. Peter Lüth Prophyta, D	<i>Keynote:</i> Plant protection using fungal antagonists
16:00-17:30	Poster Demonstration II	-Natural Antifungal Compounds -Sensitivity Monitoring

Thursday, April 25, 2013

Regulatory Aspects and Food Chain Requirements - Chair: Prof. P. Russell

08:00	Dr. Karsten Hohgardt Federal Office of Consumer Protection and Food Safety, D	<i>Keynote</i> : Challenges of regulation (EC) 1109/2009 and the new plant protection act
08:30	Dr. Lise Nistrup Jørgensen Institute of Agroecology, DK	Ranking of fungicides according to risk assessments for health and environment
08:50	Prof. Mohamed Khan North Dakota State Univ. and Univ. of Minnesota, USA	Developing fungicide recommendations for Cercospora leaf spot control in the USA
09:10	Coffee	

Sensitivity Monitoring - Chair: Dr. Helge Sierotzki

09:30	Dr. Trevor Wicks SARDI, AUS	Development in Australia of grape powdery mildew strains resistant to QoI fungicides
09:50	Dr. Rosie Bryson BASF SE, D	A European overview of the sensitivity of <i>Mycosphaerella graminicola</i> to DMI fungicides in vitro and the relative impact on field performance
10:10	Dr. Stephen Parnell Rothamsted Research, UK	Designing sensitivity monitoring programs for early detection
10:30	Dr. Guido Schnabel Clemson University, USA	Fungicide-induced mutagenesis in <i>Monilinia fructicola</i> and implications for resistance management
10:50	Dr. Huub Schepers Wageningen University Research, NL	Reduced efficacy of fluazinam against some Green 33-isolates of <i>Phytophthora infestans</i> in The Netherlands
11:10	Closing - Prof. Dr. Heinz-Wilhelm Dehne	

Monday, April 22, 2013

16:20-18:00 - **Poster Demonstration I**

New Modes of Action and Fungicides - Chair: Dr. Dietrich Hermann

Dr. Gayane Avetisyan
N.V.Tsitsin Main Botanical Garden, Russia
Influence of oxidative stress on the direction of infectious structures of the wheat powdery mildew pathogen

Dr. Thiruvengadam Raguchander
Tamil Nadu Agricultural University, India
Defense responses of grapevine to *Uncinula necator* induced by a new molecule: azoxystrobin

New Technologies and Applications - Chair: Dr. Bart Fraaije

Dr. Andrey Ryabchenko
N. V. Tsitsin Main Botanical Garden, Russia
Application of heat-conducting paste for investigation of refrigerated biological samples with scanning electron microscopy

Dr. Hideo Ishii
National Institute for Agro-Environmental Sciences, Japan
Treatments with acibenzolar-s-methyl protect cucumber plants from various diseases using orchestrated resistance mechanisms

Dr. Annegret Schmitt
Julius-Kühn-Institute, Germany
Innovative strategies for copper-free low input and organic farming systems (eu-project co-free)

Mr. Jürgen Derpmann
University of Bonn, Germany
Effects of fungicide strategies on benzimidazole resistance of *Botrytis cinerea* in grapevine

Resistance Risk Assessment - Chair: Dr. Andreas Mehl

Mrs. Marie-Cécile Dufour
INRA, France
Variability in the sensitivity of biotrophic grapevine pathogens (*Erysiphe necator* and *Plasmopara viticola*) to acibenzolar-s methyl and two phosphonates

Mrs. Sandra Gerth
ZEPP, Germany
Laboratory studies on the efficacy of cereal fungicides depending on temperature and concentration

Dr. James Fountaine
Scotland's Rural College (SRUC), UK
Fungicide resistance strategies in barley and oilseed rape

Mrs. Sabrina Rupp
University of Kaiserslautern, Germany
Botrytis anti-resistance management strategies in soft fruit fields

Mrs. Diana Steinhauer
Syngenta Crop Protection, Switzerland
Deciphering fungicide resistance mechanisms in *Mycosphaerella graminicola*, towards an assessment of resistance risk in new active ingredient research

Mr. Omar Gutierrez-Alonso
Rothamsted Research, UK
Investigating adaptation of *Mycosphaerella graminicola* to multi-site inhibitors

Complex II Inhibitors - Mode of Action and Resistance - Chair: Dr. Gerd Stammer

Dr. Kristin Klappach
BASF SE, Germany
Tomato fruit assay for SDHI efficacy on *Botrytis cinerea* strains with mutations in the *sdh* gene

Dr. Anastasios Malandrakis
Agricultural University of Athens, Greece
Biological and molecular characterization of *Penicillium expansum* isolates with laboratory-induced resistance to succinate dehydrogenase inhibitors (SDHIs)

Fungicide Resistance - Molecular Aspects, Diagnostics and Genetics - Chair: Prof. Ulrich Gisi

Dr. Marie-France Corio-Costet
INRA, France

Assessment of fungicide resistance and pathogen diversity in *Erysiphe necator* using quantitative real-time PCR assays, in France (2008-2012)

Dr. Sabine Fillinger
INRA, France

Botrytis pseudocinerea is resistant to the fungicide fenhexamid due to detoxification by the cytochrome p450 monooxygenase cyp684

Dr. Katarzyna Pieczul
Institute of Plant Protection, Poland

Analysis of cyp51 gene in triazole resistant and sensitive isolates of *Cercospora beticola* collected in western Poland

Mr. Steven Kildea
Teagasc, Ireland

Changes in the frequency of Irish *Mycosphaerella graminicola* cyp51 variants, 2006-2011

Dr. Gerd Stammler
BASF SE, Germany

Pathogens with low QOI resistance risk

Dr. Guido Schnabel
Clemson University, USA

Identification and characterization of fungicide resistance in *Botrytis cinerea* from strawberry

Wednesday, April 24, 2013

16:00-17:30 – **Poster Demonstration II**

Natural Antifungal Compounds - Chair: Dr. Erich-Ch. Oerke

- | | |
|--|---|
| Prof. Mohamed Sallam
Assiut University, Egypt | Antifungal activity of certain plant extracts against early blight disease of tomato |
| Dr. Nashwa Sallam
Assiut University, Egypt | Biocontrol of cantaloupe damping-off disease using formulations of antagonistic fungi |
| Prof. Mamdoh Ismail Ahmed
El-Minia University, Egypt | Identification and pathogenicity of phytopathogenic bacteria associated with soft rot disease of girasole tuber in Egypt |
| Mr. AbdulAziz Al-Askar
King Saud Univ., Saudi Arabia | <i>In vitro</i> antifungal activity of three Saudi plant extracts against some phytopathogenic fungi |
| Dr. Ali Elagael
Tripoli University, Libya | Evaluation of antifungal metabolites produced by <i>Pseudomonas fluorescens</i> (PS02 and PS14) isolates for biocontrol of <i>Fusarium culmorum</i> |
| Dr. Setti Benali
Université de Chlef, Algeria | Isolation, screening and characterization of Streptomyces species for biological control of crown gall caused by <i>Agrobacterium tumefaciens</i> . |
| Prof. Bencheikh Mohamed
Université de Khemis Meliana, Algeria | Streptomyces efficiency against Ascochyta foot rot in pea (<i>Pisum sativum</i>) seedlings |
| Dr. Tatyana Yurina
M.V.Lomonosov State University, Russia | On the allelopathic influence of some species of plants in agrocenoses symbiotic mycobiota |
| Dr. Larisa Shcherbakova
Russian Research Institute of
Phytopathology, Russia | Enhancing the sensitivity of <i>Stagonospora nodorum</i> to certain azole and strobilurin fungicides by co-application of natural compounds |
| Mr. David Garcia-Rellán
Universidad Politécnica de Valencia, Spain | Composition and antifungal activity of <i>Satureja montana</i> l. essential oil against fungal pathogens associated with grapevine declines |
| Dr. Mercedes Verdeguer Sancho
Universidad Politécnica de Valencia, Spain | Antimicrobial and herbicidal activity of eugenol, the main compound of <i>Syzygium aromaticum</i> (l.) merr. et l.m. Perry essential oil |
| Dr. Tarikere Ganapati Nagaraja
The New College, Kolhapur, India | In vitro evaluation of antifungal properties of <i>Zanthoxylum rhetsa</i> (ROXB)DC |
| Dr. Kuppusami Prabakar
Tamil Nadu Agricultural University, India | Antifungal compound from <i>Adenocalymma alliaceum</i> mediated disease resistance for the control of postharvest pathogens in mango |
| Dr. Patil Bhimarao
Sadguru Gadage Maharaj College, India | Antifungal activity of somebotanicals against inhibition of spore germination of <i>Puccinia purpurea</i> Cook |

Sensitivity Monitoring - Chair: Dr. Helge Sierotzki

- | | |
|--|--|
| Prof. Mohamed Hassan
Assiut University, Egypt | Acquired resistance to Ridomil Mancozeb on <i>Stemphylium vesicarium</i> the causal agent of onion stemphylium leaf blight in Egypt. |
| Mr. Douglas Wilson
Nufarm, Australia | Yellow Sigatoka (<i>Mycosphaerella musicola</i>) populations develop resistance to QoI fungicides in Australia |
| Dr. Gerd Stammler
BASF SE, Germany | Sensitivity of <i>Venturia inaequalis</i> to dithianon |

Mrs. Natasha Akemi Hamada IFPR, Brazil	Sensibility of <i>Colletotrichum</i> spp., the causal agent of Glomerela leaf spot on apple, to mancozeb and tiophanate-methyl
Mrs. Irene Maja Nanni University of Bologna, Italy	Sensitivity to Carboxylic Acid Amide fungicides in <i>Plasmopara viticola</i> populations in Northern Italy
Dr. Marina Collina University of Bologna, Italy	Efficacy of an electrolyzed water (Verdeviva) towards pathogens of fruit crops
Mrs. Ellen Göbbels University of Bonn, Germany	Influence of timing on the effect of azole fungicides on Fusarium infection of wheat varieties differing in susceptibility
Dr. Duraisamy Saravanakumar Tamil Nadu Agricultural University, India	A combination of tebuconazole 50% + trifloxystrobin 25% wg for the management of <i>Alternaria</i> and Fusarium rot in tomato
Dr. Nenad Trkulja Inst. Plant Prot. and Environment, Belgrade, Serbia	The sensitivity of the Serbian populations of <i>Cercospora beticola</i> sacc. to benzimidazole and triazole fungicides