XXI Convegno Nazionale
Società Italiana di Patologia Vegetale
(SIPaV)

Difesa delle piante per l'alimentazione e l'energia

BOOK OF ABSTRACTS

Edited by: Giordano L., Spadaro D., Gonthier P.

Torino, 21-22-23 Settembre 2015

Centro Congressi Torino Incontra
Via Nino Costa 8, Torino

***ASPERGILLUS FLAVUS* AND *ZEA MAYS*.** **C. Miccoli[1], M. Reverberi[1], C. Fanelli[1], G. O'Brian[2], G.A. Payne[2], S. La Starza[1].** *[1]Department of Environmental Biology, Sapienza University of Roma, Piazzale Aldo Moro 5, I-00185 Roma, Italy. [2]Department of Plant Pathology, North Carolina State University, 851 Main Campus Drive, Raleigh 27695 – 7567, NC, USA. E-mail: cecilia.miccoli2@gmail.com*

Aspergillus flavus is an opportunistic and saprophytic crops pathogen mostly known as an effective mycotoxins producer. Starting from previous studies aimed to identify gene clusters encoding for secondary metabolites, involved in pathogenicity of *A. flavus*, we focused on Cluster32 and specifically on a Zn_2Cys_6 transcription factors, present inside the cluster. Our purpose is to understand its role in the regulation of Cluster32 expression and to clarify finally its significance within the process of pathogenesis. To achieve this, we designed a knockout mutant for Zn_2Cys_6 via the TOPO cloning method: we have assembled a construct containing the *argD* gene, coding for the enzyme acetyl ornithine aminotransferase, flanked by 3'UTR and 5'UTR, regions homologue to Zn_2Cys_6. Once obtained, we used the deletion construct to transform AFC-1, a double auxotroph mutant incapable of producing Arginine and Uracil. Simultaneously, to characterize better the metabolic profile related to the cluster 32, we produced overexpression mutants of Zn_2Cys_6 fused to GFP. Thus, mutants were screened by fluorescence emission. Such mutant, have been tested to assay pathogenicity and fitness in different environmental conditions, compared to the wild type.

82. MECHANISMS OF FOOD ISOLATED BIOCONTROL YEASTS TO CONTROL POST-HARVEST PHYTOPATOGENIC MOULDS. **L. Parafati[1], C. Restuccia[1], A. Vitale[1], G. Polizzi[1], M. Wisniewski[2], G. Cirvilleri[1].** *[1]Department of Agriculture, Food and Environment (Di3A), University of Catania, Via Santa Sofia 100, I-95123 Catania, Italy. [2]United States Department of Agriculture, Agricultural Research Service (USDA-ARS), Kearneysville, WV 25430 USA. E-mail: gcirvil@unict.it*

Biological control by antagonistic yeasts is a promising strategy for reducing the common use of fungicides to control post-harvest phytopathogenic moulds. The knowledge of their mode of action is an important step to improve their performance, to develop appropriate formulations, and to establish selection strategies of new biocontrol agents. In this study, food isolated yeast strains demonstrated antifungal activity against *Penicillium digitatum*, *P. italicum* and *Botrytis cinerea* at different level depending on species and commodity. Iron competition, ability to form biofilm and to colonize fruit wounds were the main mechanisms of action for *Metschnikowia pulcherrima*. The production of glucanase, chitinase and protease, and the ability to colonize the wounds were the most important mechanisms of action in *Aureobasidium pullulans* and *Wickerhamomyces anomalus*. Moreover, the biocontrol abilities of *Saccharomyces cerevisiae* and *W. anomalus* was proved to be correlated with killer phenotype, and the expression of *WaEXG1* and *WaEXG2* genes coding the killer toxins exoglucanases was studied in *W. anomalus* strain by RT-qPCR. The production of VOCs with *in vitro* and *in vivo* inhibitory effects was observed for all the tested species. Peroxidase and superoxide dismutase activity assays were conducted to evaluate the ability to induce host systemic resistance. In *in vivo* experiments, strains demonstrated a significant reduction of post-harvest green, blue and grey moulds of citrus, table grape and strawberries. It is concluded that the understanding of the multiple and different modes of action of the tested yeast species represents a key step to explain the excellent control of post-harvest *Penicillium* spp. and *Botrytis* spp. moulds of oranges, grapes and strawberries fruits.

83. BIOACTIVE METABOLITES FROM BASIDIOMYCETE *TRAMETES VERSICOLOR* IN THE CONTROL OF FUNGAL PATHOGENS AND MYCOTOXINS. **A. Parroni, M. Scarpari, C. Pietricola, M. Reverberi, C. Fanelli.** *Department of Environmental Biology, Sapienza University of Roma, Piazzale Aldo Moro 5, I-00185 Roma, Italy. E-mail: alessia.parroni@uniroma1.it*

Among pathogens that attack plants, fungi play a pivotal role. Pathogenic fungi (e.g. *Aspergillus*, *Penicillium* and *Fusarium*) may synthesize mycotoxins, dangerous metabolites with toxic effects on animals and humans. For this, Europe strictly regulated their presence in feed and food (e.g. 1881/2006). Mycotoxin contamination in foods and feeds is limited mainly by chemical control. Nevertheless, the use of chemicals led to a severe environmental pollution, to the emergence of resistant pathogen populations and presence of chemical residues in food products. The European Community has banned about 50% of chemicals commonly used in crop production (EC/129/2009). For this, new "green" approaches for controlling fungal contamination and preventing or detoxifying mycotoxins, are under study. The biological control, with GRAS (Generally Recognised As Safe) organisms and/or their products (namely, biocontrol agents), is increasing. A promising approach is the use of bioactive compounds from *Trametes versicolor*, a "medicinal mushroom", with healing properties toward some human diseases. These metabolites, non-toxic for humans and animals, are under study for enhancing plant defences and/or for inhibiting pathogen growth and/or toxin synthesis. Here we present some compounds, a purified polysaccharide (Trametano) and its oligosaccharides, that can inhibit mycotoxins synthesis such as aflatoxins, ocratoxin A, patulin and fumonisin B1. They can be considered a new eco-compatible tool for mycotoxins control, in line with EU directives.

84. EFFECT OF *PSEUDOMONAS SYRINGAE* pv. *ACTINIDIAE* ON POST-HARVEST STORAGE AND HEALTH OF KIWIFRUIT "HAYWARD". **S. Principe[1,2], M.L. Gullino[1,2], A. Garibaldi[2], D. Spadaro[1,2].** *[1]Department of Agricultural, Forestry and Food Sciences (DISAFA), University of Torino, Largo Paolo Braccini 2, I-10095 Grugliasco (TO), Italy. [2]Centre of Competence for the Innovation in the Agro-Environmental Field – AGROINNOVA, University of Torino, Largo Paolo Braccini 2, I-10095 Grugliasco (TO), Italy. E-mail: simona.principe@unito.it*

Pseudomonas syringae pv. *actinidiae* (*Psa*) is the causal agent of bacterial canker of kiwifruit causing large economic crop losses to the production of European and non-European *Actinidia deliciosa* and *A. chinensis* since 2008. The quality and the health of the fruits can be influenced by the management practices, storage techniques and climatic conditions. The objective of this work was to assess the influence of *Psa* on post-harvest quality of fruits harvested from diseased and healthy orchards affected by *Psa*, as a result of two storage methods, in Normal Atmosphere (NA) and in Controlled Atmosphere (CA) over a period of 120 days. The study has been developed, for two years, by monitoring physiochemical parameters: firmness, Total Soluble Solid (TSS), and Titratable Acidity (TA). Further analysis of Dry Matter (DM) and major nutrients, calcium and nitrogen, was performed to observed the changing responses of fruit in relationship with different disorders. The incidence of *Botrytis* rot after storage was also measured. A further trial in CA with 1-methylcicloprope (1-MCP) was performed. Fruits harvested from orchards affected by *Psa* showed reduction in storage time with lower firmness and TA and higher TSS and susceptibility to *Botrytis* rot. The CA storage helps to make the fruits firmer, more if preceded by 1-MCP treatment, and reduces the values of TSS for both categories of fruits analyzed obtained by plants diseased and healthy. In conclusion, *Psa* infection in field influenced post-harvest rots and kiwifruits quality.

ISBN-13: 978-8846743084

Edizioni ETS, Pisa - Italy