Sgrulletta[1]. *[1]CRA, Unità di ricerca per la valorizzazione qualitativa dei cereali, Via Cassia 176, 00191 Roma, Italia. [2]Università Campus Bio-Medico di Roma, Via Alvaro del Portillo 21, 00128 Roma, Italia. [3]CRA, Centro di ricerca per la frutticoltura, Via di Fioranello 52, 00134 Roma, Italia. E-mail: marina.pasquini@entecra.it*

The antimicrobial properties of natural compounds or synthetic peptides against economically important plant pathogenic fungi and bacteria have been studied for their utilization in crop protection. Vromindolines, starch-bound proteins involved in the extra-softness of the oat endosperm, are structurally similar to puroindolines PIN-A and PIN-B and as PINs are characterized by a triptophan-rich domain likely responsible for their antimicrobial activity. Alkylresorcinols (ARs) are a group of phenolic lipids involved in a multitude of interactions with biological membranes; their amphiphilic and phenolic nature has been associated with their biological activity, but the mechanism of action is not yet explained. Cereal alkylresorcinols are found to be mixtures of saturated, monoenoic and dienoic homologues with mainly saturated alkyl chains in the range of 15-27 carbon atoms. Analyses have been carried out to test the antibacterial and antifungal activity of the vromindolines and a synthetic peptide (TRP), resembling their specific tryptophan-rich domain. When tested *in vitro* these compounds showed a 70% inhibition of the growth of *Escherichia coli* and a minor effect on a DON (deoxynivalenol) producing strain of *Fusarium graminearum*. The antifungal activity of AR extracts, isolated from wheat intact grain with two different solvents (ethyl acetate and acetone) was tested against *F. graminearum*. The bioassays showed that the fungal growth was distinctly reduced by addition of 400 µg of AR extracts to nutrient agar, the various extracts exhibiting a different inhibitory ability. The results suggest the availability of novel compounds that could be considered alternative natural fungicides.

CHARACTERIZATION OF THE HYPERSENSITIVE RESPONSE INDUCED BY THE C2 PROTEIN OF TOMATO YELLOW LWAF CURL SADINIA VIRUS IN *NICOTIANA* spp.

E. Noris[1], A.J. Love[2], R. Lozsa[1] and S. Matic[1]. *[1]Istituto di Virologia Vegetale del CNR, Strada delle Cacce 73, 10135 Torino, Italy. [2]The James Hutton Institute, Invergowrie Dundee DD2 5DA, United Kingdom. E-mail: s.matic@ivv.cnr.it*

The begomovirus *Tomato yellow leaf curl Sardinia virus* (TYLCSV) causes a devastating disease of tomato plants all over the Mediterranean basin. Several functions have been attributed to the C2 protein of different begomoviruses. A functional analysis of the TYLCSV C2 protein has been undertaken. *Agrobacterium*-mediated transient expression of C2 resulted in a local necrotic hypersensitive response (HR) in *Nicotiana benthamiana* and *N. tabacum*, as confirmed with trypan blue and 3,3'-diaminobenzidine staining, thus indicating that C2 plays a key role in pathogenicity.

We analyzed the dependence of C2-induced HR by utilizing VIGS vectors to silence some of the HR-related genes, such as SGT1, RAR1, and MEK2; HR was influenced upon silencing of all of them. We also observed that the severity of HR was temperature dependant, so that HR was more pronounced at 25°C than at 20°C. Using NahG transgenic *N. benthamiana* lines which fail to accumulate salicylic acid (SA), a key potentiator of HR, we observed a different HR in C2-infiltrated tissue at both temperatures, indicating that SA participates to regulate the intensity of C2-dependent HR. However, TYLCSV natural infection is not normally associated with HR, suggesting that the virus encodes factors that counter this response. Upon co-agroinfiltration with other viral non-structural proteins, C2-induced HR could be partially counteracted.

SEED HEALTH IN ORGANIC FARMING SYSTEM.

L. Orzali[1], G. Di Giambattista[1], L. Ortolani[2], A. Matere[3], A. Santori[1], F. Quaranta[3], M. Pasquini[3] and L. Riccioni[1]. *[1]CRA, Centro di Ricerca per la Patologia Vegetale, Via C.G. Bertero 22, 00156 Roma, Italy. [2]AIAB, Via Piave 14, 00187 Roma, Italy. [3]Unità di Ricerca per la Valorizzazione Qualitativa dei Cereali, Via Cassia 176, 00191 Roma, Italy. E-mail: luca.riccioni@entecra.it*

Seed is the basic unit of crop production, and seed health plays a key role for successful production especially in organic farming systems, where less efficient seed-treatments are available for managing seed-borne disease. Phytosanitary seed analysis were carried out to verify the actual impact of seed-borne diseases in some organic farms distributed throughout Italy and to evaluate the health of seeds used in Italian organic agriculture. Samples of durum and common wheat, carrot, bean and chickpea seeds of different typologies (organic commercial seeds, self-produced organic seeds and conventional not treated seeds allowed) were analysed. In addition, seeds and production of some durum and common wheat varieties were analysed for two years, to verify a possible relationship between the health status of seeds sown and production under organic farming systems. Seed health testing was performed using the standard blotter method described by the International Rules for Seed Testing, and a list of the fungal species found and identified on seeds was drawn.

AN INTEGRATED STUDY ON THE EFFECTS OF *GRAPEVINE LEAFROLL-ASSCOCIATED VIRUS 1, GRAPEVINE VIRUS A* AND *GRAPEVINE RUPESTRIS STEM PITTING-ASSOCIATED VIRUS* ON FIELD PERFORMANCE AND BERRY QUALITY OF *VITIS VINIFERA* cv. NEBBIOLO.

D. Pacifico[1], M. Giribaldi[2], M. Purrotti[2], D. Santini[1], F. Mannini[1], P. Caciagli[1], L. Rolle[3], L. Cavallarin[2], M.G. Giuffrida[2] and C. Marzachì[1]. *[1]Istituto di Virologia Vegetale del CNR, Strada delle Cacce 73, 10135 Torino, Italy. [2]Istituto di Scienze delle Produzioni Alimentari del CNR, Via Leonardo da Vinci, 44, 10126 Grugliasco (TO), Italy. [3]Dipartimento di Valorizzazione e Produzione Agro Alimentare, Microbiologia Agraria e Tecnologie Alimentari, Via Leonardo da Vinci 44, 10126 Grugliasco (TO), Italy. E-mail: d.pacifico@ivv.cnr.it*

Viruses can affect grapevine yield and field performance, but the impact of infection on the quality and safety of final products has been scarcely investigated. This study reports the first analysis of agronomic performance, fruit texture and composition, and proteomic changes occurring in berries of virus-infected *Vitis vinifera* cv. Nebbiolo, grown in field conditions. The cv. Nebbiolo clone 308 infected by *Grapevine leafroll-associated virus 1* (GLRaV-1), *Grapevine virus A* (GVA), and *Grapevine rupestris stem pitting-associated virus* (GRSPaV), were compared to healthy vines obtained following heat treatment of the original infected mother plant. The phytosanitary status of each plant was assessed by RT-PCR, and GLRaV-1 and GVA concentration determined by quantitative reverse transcription-Real time PCR (qRT-PCR). Mean loads of GLRaV-1 and GVA in the infected plants were 2.5 (SD=0.8) and 0.4 (SD=0.2) viral genomes/100 GAPDH transcript copies, respectively. The distribution of the viral loads was uniform among the infected plants. The comparison of field performance and fruit quality of healthy and infected plants revealed similar agronomical behaviour, with significant