Dip.to Scienze Agrarie, Alimentari
ed Agro-ambientali

UNIVERSITA' DI PISA

XX Convegno Nazionale
Società Italiana di Patologia Vegetale
(S.I.Pa.V.)

Environmentally loyal plant protection: from nano- to field-scale

Pisa, 22-23-24 Settembre 2014

Aula Magna Polo didattico delle Piagge
Università di Pisa
Viale Giacomo Matteotti, 3 Pisa

such as *Erwinia amylovora*, *Pseudomonas syringae* pv. *actinidiae* and *Xanthomonas arboricola* pv. *pruni*.

PAW was then assayed in greenhouse trial to evaluate its ability to induce resistance in tomato plants against *X. vesicatoria* (Xv). PAW was applied at the root apparatus five days before and two days after Xv experimental inoculation; negative and positive controls were Bion®, streptomycin sulphate and SDW, respectively.

In *in vitro* experiments, PAW did not show bacterial inhibition neither using diffusion nor dilution method. In greenhouse no phytotoxicity was detected on tomato plants, disease severity (DS) assessments highlighted a significant disease inhibition and a relative protection of approximately 35%.

12. DESIGN AND CONSTRUCTION OF MULTI-ENZYME BIOSENSOR FOR *IN VITRO* MYCOTOXIN DETECTION.

G. Calia[1,2], P. Monti[1,3], S. Fiori[1], P. Urgeghe[1], S. Jaoua[4], P.A. Serra[2], G. Delogu[3], Q. Migheli[1]. *[1]Dipartimento di Agraria, Università degli Studi di Sassari, Via E. De Nicola 9, I-07100 Sassari, Italy. [2]Dipartimento di Medicina Clinica e Sperimentale, Università degli Studi di Sassari, V.le San Pietro 43/b, I-07100, Sassari, Italy. [3]Istituto CNR di Chimica Biomolecolare UOS Sassari, Traversa La Crucca 3, I-07100, Sassari, Italy. [4]Department of Biological & Environmental Sciences, College of Arts and Sciences, Qatar University, P.O. Box: 2713, Doha, Qatar. E-mail: qmigheli@uniss.it*

An amperometric biosensor based on acetylcholinesterase (AChE) inhibition by mycotoxin is proposed for application in a multi-enzyme biosensor design: the more AChE is inhibited by mycotoxins (or neostigmine), the less choline is oxidized by choline oxidase (ChO) to betaine aldehyde and H_2O_2. The H_2O_2 oxidation signal is influenced by the presence of mycotoxins. Enzymes were co-immobilized onto a Pt/Ir electrode surface coated with *ortho*-phenylendiamine (*o*PD) to prevent signal of interferents. *In vitro* sensitivity of the AChE/ChO biosensor was determined by injecting in the electrochemical cell known amounts of acetyl choline (ACh). *In vitro* calibrations with neostigmine and standard mycotoxins were performed with a miniaturized telemetry system. The effect of neostigmine (1.12 µg/mL), aflatoxin mix (2.5 ng/mL) and patulin (15 ng/mL) on the AChE/ChO sensor was determined to be a decrease in response to ACh respectively by 25%, 18 % and 10%; the ochratoxin A and trichothecene mix did not significantly inhibit AChE. An aflatoxin-producing strain of *Aspergillus flavus* was grown in mycotoxin-inducing (YES) vs non-inducing medium for 15 days. The YES medium with *A. flavus* showed a decrease in response to ACh by 15% at d 15. Future investigation will aim to evaluate whether the AChE/ChO biosensor may represent an analytical device capable to detect in real-time the presence of mycotoxin contaminants in food and feed matrices.

This publication was made possible by NPRP grant # NPRP 4-259-2-083 from the Qatar National Research Fund (a member of Qatar Foundation). The statements made herein are solely the responsibility of the authors.

13. NEW STRATEGIES FOR THE CONTROL OF ROOT AND FOOT ROT OF DURUM WHEAT.

V. Campanella, C. Miceli. *Consiglio per la Ricerca e la Sperimentazione in Agricoltura – Centro di Sperimentazione e Certificazione delle Sementi (CRA-SCS), V.le Regione Siciliana sud-est 8669, 90121 Palermo. E-mail: vito.campanella@entecra.it*

Root and foot rot complex is one of the most widespread and harmful diseases for durum wheat, in Sicily (Southern Italy), mainly due to *Bipolaris sorokiniana* (Sacc.) Shoem, *Fusarium acuminatum* (Ellis & Everhart), *F. avenaceum* (Fries) Saccardo, *F. compactum* (Wollenweber) Gordon, *F. crookwellense* (Burgess, Nelson & Toussoun), *F. culmorum* (W.G. Smith) Saccardo, *F. graminearum* (Schwabe), *F. sambucinum* (Fuckel), *Microdochium nivale* (Samuel & Hallet). The disease is widespread in Sicily because of the monoculture and short crop rotations and is not easily managed by fungicides applied to the soil, only the use of proper rotation can help to control the disease. Moreover, environmental pollution and hygienic-sanitary factors have increased the interest for alternative control methods, safer for both ecosystem and people. To this regard, *Brassica carinata* tillage was investigated in order to verify its capacity to reduce root and foot rot inoculum density (ID), and to compare durum wheat yield cultivated in succession to *B. carinata* and durum wheat itself. Results showed an overall reduction of root and foot rot ID in the soil. Moreover, *B. sorokiniana*, *F. culmorum* and *F. crookwellense* were not isolated in flowering stage and after green manure of *B. carinata*. Disease incidence and severity were significantly reduced in durum wheat grown in succession to *B. carinata*, in comparison to durum wheat monoculture. The production of durum wheat in succession to *B. carinata* was significantly higher than that of the durum wheat cultivated in monoculture, with an increase of 38.9% of the grain yield.

14. WIDESPREAD ENDOPHYTIC OCCURRENCE OF *PHOMOPSIS THEICOLA* (TELEOMORPH *DIAPORTHE FOENICULINA*) AT THE ASTRONI NATURE RESERVE.

R. Carrieri, E. Lahoz, R. Nicoletti[1]. *Consiglio per la Ricerca e la Sperimentazione in Agricoltura, Unità di Ricerca CAT, Via P. Vitiello 108, 84018 Scafati, Italy; [1]current address: Dipartimento di Agraria, Università di Napoli 'Federico II', Via Università 100, 80055 Portici, Italy. E-mail: rosario.nicoletti@entecra.it*

The species *Phomopsis theicola* Curzi was described in 1927 based on isolates from leaves and twigs of *Camellia sinensis* at the Botanical Gardens of the University of Pavia, Italy. Since then its occurrence has been apparently neglected until the years 2000s, when the application of biomolecular techniques for fungal identification has disclosed a more widespread distribution as both an endophyte and a pathogen. On the occasion of an investigation on fungal endophytes of forest plants carried out at the Astroni Nature Reserve near Napoli, isolates of *Phomopsis* resulted among the most frequently recovered taxa, with a host range including maple (*Acer campestre*), vetch (*Coronilla* sp.), hawthorn (*Crataegus monogyna*), spindle (*Euonymus europaeus*), myrtle (*Myrtus communis*), hop hornbeam (*Ostrya carpinifolia*), and oaks (*Quercus ilex*, *Q. robur*). Biomolecular characterization of the available isolates by means of ITS-5.8S rDNA sequencing showed all of them to belong to *P. theicola* (teleomorph *Diaporthe foeniculina*), with two exceptions from hawthorn and hornbeam conforming to the phylogenetically close *Phomopsis vaccinii* (*Diaporthe vaccinii*). To our knowledge this is the first report of these two species from the cited hosts. The occurrence of *P. theicola* in asymptomatic plants within a natural context is indicative of a fundamental endophytic habit resulting from a horizontal spread among taxonomically unrelated hosts. The antagonistic aptitude by one of these isolates observed *in vitro* may be indicative of a possible role of this species in defensive mutualism which deserves to be further investigated.

15. PRELIMINARY DATA ON THE PRESENCE OF GRAPEVINE PINOT GRIS VIRUS IN LOMBARDY.

P. Casati[1], G. Durante[2], F. Quaglino[1], E. Zacchi[2], P.A. Bianco[1]. *[1]DiSAA Dipartimento di Scienze Agrarie e Ambientali, Università degli Studi, via Celoria 2 -20133 - Milano, Italy. [2]International Plant Analysis and Diagnostics*