



10th International Congress of Plant Pathology

Bio-security, Food Safety and Plant Pathology:
The Role of Plant Pathology in a Globalized Economy.

August 25-30 2013, Beijing, CHINA

<http://www.icppbj2013.org>

China's National Grand Theater



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Chemical Control of Plant Diseases-1,2

Organisers:

Hideo Ishii (National Institute for Agro-Environmental Sciences, Japan)

Dietrich Hermann (Syngenta Crop Protection Münchwilen AG, Research Biology, Switzerland)

Cláudia Godoy (National Center of Soybean Research, Brazil)

Mingguo Zhou (Nanjing Agricultural University, China)

Session1: Progress of Chemical Control

Time: 16:00-18:00, Tuesday, August 27, 2013

Chairpersons: Dietrich Hermann and Cláudia Godoy

Invited talks:

16:00-16:20 Present and prospects for chemical control of soybean rust in Brazil

Carlos Alberto Forceline (University of Passo Fundo, Brazil)

16:20-16:40 Current status and prospect of fungicide innovation in China

Junli Liu (State Key Laboratory for Discovery and Development of Novel Pesticides, Shenyang Research Institute of Chemical Industry Co., Ltd., China)

16:40-17:00 Benefit of chemical seed treatments on crop yield and quality

Gilberto Olaya (Syngenta Crop Protection, USA)

17:00-17:20 Contribution of plant defense activators to rice production in Japan

Kenji Umemura (Agri&Vet Research Labs, Meiji Seika Pharma Co. Ltd., Japan)

Short talks:

17:20-17:30 Solatenol™, the second generation benzonorbornene SDHI carboxamide with outstanding performance against cereal diseases

Andrew J. Leadbeater (Syngenta Crop Protection AG, Switzerland)

17:30-17:40 Genus-specific CYP51C of *Fusarium graminearum* identified as a novel CYP51 rather than azole fungicide target sterol 14 α -demethylases

Jieru Fan (Department of Plant Pathology, China Agricultural University, China)

17:40-17:50 Chemical control of white mold (*Sclerotinia sclerotiorum*) on soybean in Brazil

Maurício Conrado Meyer (Brazilian Agricultural Research Corporation, Embrapa Soybean, Brazil)

17:50-18:00 Oxathiapiprolin: The first member of a novel class of Oomycete fungicides

Jack A. Bruhn (DuPont Crop Protection, Stine-Haskell Research Center, USA)

Session2: Resistance Management

Time: 13:30-15:30, Wednesday, August 28, 2013

Chairpersons: Hideo Ishii and Mingguo Zhou

Invited talks:

13:30-13:50 Fungicide resistance in cereal pathogens

Gerd Stammler (BASF SE, Agricultural Center, Germany)

13:50-14:10 Research progress in fungicide resistance in China

Zhonghua Ma (Institute of Biotechnology, Zhejiang University, China)

14:10-14:30 SDHI fungicide resistance on horticultural crops

Hideo Ishii (National Institute for Agro-Environmental Sciences, Japan)

Progress in mechanism of carbendazim resistance in *Gibberella zeae*

Mingguo Zhou (Nanjing Agricultural University, China)

14:30-14:50 Fungicide resistance in flower, foliar, and fruit pathogens of tree fruit and nut crops in California

James E. Adaskaveg (Department of Plant Pathology and Microbiology, University of California, Riverside, USA)

Short talks:

14:50-15:00 Metabolomics: A novel bioanalytical tool in pesticide research and development

Konstantinos A. Aliferis (Department of Plant Science, McGill University, Canada)

15:00-15:10 Multiple fungicide resistance, population dynamics, and genetic diversity of *Botrytis* spp.

Matthias Hahn (Department of Biology, University of Kaiserslautern, Germany)

15:10-15:20 Detection of copper and antibiotic resistant bacteria from pome and stonefruit blossoms

S. Chin Gouk (Department of Primary Industries, Biosciences Research Division, Australia)

15:20-15:30 Resistance to multiple fungicides including fludioxonil and mechanisms of resistance in *Botrytis cinerea* from blackberry in the Southeastern United States

Xingpeng Li (School of Agricultural, Forest & Environmental Sciences, Clemson University, USA)

Volume 43 (supplement) August 2013

Acta Phytopathologica Sinica

ICPP 2013
10th International Congress of Plant Pathology

ABSTRACTS

25-30 August 2013, Beijing, China

orchards has been known to exert selection pressure for development of resistant microflora. Although antibiotics are not used in Australian orchards, genetic linkage of copper and antibiotic resistance may enhance co-selection of antibiotic resistant bacteria in an orchard ecosystem. More than a thousand bacterial isolates from pome and stonefruit blossoms collected from orchards from five eastern states of Australia were tested for resistance to copper and antibiotics. Copper resistance was screened using casitone-yeast-extract-agar impregnated with copper sulphate concentrations ranging from 0 to 360 ppm. Sensitivity of bacteria to twelve medically important antibiotics was tested using disc-diffusion assays. Copper and antibiotic resistant *Pseudomonas* spp. were detected for the first time from apple, pear and cherry orchards. The highest frequency of resistance was against ampicillin and penicillin, of the chemical group Penicillin; and also to erythromycin, rifampicin and vancomycin. Low frequency of resistance was against gentamycin, kanamycin, and chloramphenicol, the former two are of the chemical group, aminoglycosides. *P. syringae* isolates showed moderate frequency of resistance to streptomycin and low frequency of resistance to tetracycline. Whilst both antibiotics are used in the USA, streptomycin is only permitted for emergency use should there be an incursion of the exotic bacterial disease, fire blight. The findings indicate risks of copper and antibiotic resistance exist and more in depth understanding of the mechanism of resistance would be beneficial.

P08.016 Resistance to multiple fungicides including fludioxonil and mechanisms of resistance in *Botrytis cinerea* from Blackberry in the Southeastern United States

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Botrytis cinerea causes blossom blight and fruit rot on many crops, including blackberry. Between 2010 and 2011, 202 fruit from blackberry fields were collected from North and South Carolina and single-spore colonies were obtained. Isolates were subjected to cyprodinil, fenhexamid, fludioxonil, pyraclostrobin, boscalid, thiophanate-methyl and iprodione sensitivity evaluations using germination assays and several different fungicide resistance phenotypes were discovered. The resistance mechanisms for fenhexamid, pyraclostrobin, boscalid and thiophanate-methyl were examined. Of 22 isolates resistant to fenhexamid, 18 had the F412S mutation and 4 had the F412I mutation in the *Erg27* gene. All of the 93 isolates resistant to pyraclostrobin had the G143A mutation in *SdhB* gene. Boscalid resistant isolates had the H272Y or the H272R mutation in the *CYT6* gene.

Among 69.8% of the isolates resistant to thiophanate-methyl, 87.5% contain the E198A mutation and the rest contained the E198V mutation. For three fludioxonil resistant isolates, detached fruit assays confirmed its pathogenicity after fludioxonil treatment and isolates were found without fitness penalty. Isolates resistant to fludioxonil were sensitive to NaCl and contained a 5bp deletion in the intron of the *BOS2* gene that was not present in sensitive isolates. Our study shows that resistance to multiple fungicides is widespread in *B. cinerea* populations from blackberry.

P08.001 Molecular characterization and management of metalaxyl resistant populations of *Phytophthora infestans* in India

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Management of late blight disease of potato largely depends on the use of fungicides as host resistance to *Phytophthora infestans* is highly unstable. Metalaxyl-based formulations are commonly used by the farmers to get post-infection control of the disease under congenial weather conditions. Monitoring of sensitivity levels of *P. infestans* populations from various locations in Punjab State revealed the prevalence of metalaxyl resistance to varying extent. Characterization of resistant strains based on pathological and molecular parameters was carried out. Among 48 sporangial populations of *P. infestans* studied, 8 populations showed resistant response at 100 µg/ml of metalaxyl, while 2 populations showed highly resistant response and could infect potato leaves (cv. Kufri Chandramukhi) treated with 200 µg/ml of metalaxyl with resistance factor of 60. Resistant strains were found to be highly pathogenic and exhibited competitive fitness in mixture with sensitive strains. There was no cross resistance to novel action fungicides such as mandipropamid, cymoxanil, benalaxyl, previcur, fluopicolide, azoxystrobin and multisite contact fungicides. Molecular markers were identified for resistant strains using RAPD primers and cluster analysis. Metalaxyl resistance was effectively managed under field conditions through application of novel action fungicides such as Infinito 68.75 SC (fluopicolide + propanil), Amistar 25 SC (azoxystrobin), Mandipropamid 250 SC, Acrobat 50 WP (dimethomorph) and Curzate M-8 72WP (cymoxanil + mancozeb). Development of metalaxyl resistance in *P. infestans* can be retarded by using combination of fungicides with different modes of action so as to ensure sustainable management of late blight.

P08.002 Screening of chillies germplasm against anthracnose and its management