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Center for Regulatory Research, LLC

Quarterly Newsletter
Volume 2, April 2010

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in this issue

Dear Susan,
April's newsletter issue focuses on our upcoming risk assessment training for imported plant products to be released on compact disc and highlights of current research in areas of biological control, food safety and plant biotechnology.

C4RR plans to release risk assessment training for imported plant products on compact disc for sale

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Center for Regulatory Research, LLC will release risk assessment training for imported plant products on compact disc this year. Domestic and international customers will be able to purchase the compact disc on the company web site. Topics included on the compact disc are plant protection standards, guidelines for risk assessment, pest and pathway risk assessment examples, resources for risk assessment, and risk assessment exercises. The content included on the training disc is based on training courses given by the Center for Regulatory Research, LLC to USDA-FAS Cochran Fellows. Academic, government and industry representatives will find these compact discs to be excellent resources for preparing risk assessments, accessing regulatory information, and supplementing classroom lectures.

Current Research in Biological Control

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Hajek, A. E., and I. Delalibera. 2010. Fungal pathogens as classical biological control agents against arthropods. 55:147-158.

The authors review the use of fungal entomopathogens, those fungi causing disease and death in insects, as classical biological control agents. Classical biocontrol agents are usually defined to be exotic and introduced with the intention of permanent establishment (other forms of biocontrol typically involve protecting or augmenting native natural predators). The authors compare the success of deploying traditional fungi and microsporidia with other biocontrol agents such as viruses, bacteria, and nematodes. Completed and on-going fungal biocontrol programs are analyzed, and future uses of fungi are discussed.

Monzó, C., Sabater-Muñoz, B., Urbaneja, A., and P. Castañera. 2010. Tracking medfly predation by the wolf spider, *Pardosa cribata* Simon, in citrus orchards using PCR-based gut-content analysis. 100:145-152.

Mediterranean fruit fly populations in Spanish citrus orchards have been traditionally pesticide-controlled. Biological control options can be an attractive non-chemical alternative. However, determining which agent or agents to deploy requires knowledge of target pest predation rates by potential biocontrol agents. In this paper, the authors describe a novel approach to assessing wolf spider predation of medflies using PCR. The authors developed and tested primers for the medfly and were able to successfully amplify and visualize medfly DNA from wolf spider gut contents. Of the wolf spiders analyzed, up to 15% tested positive for medfly DNA; this maximum appeared to coincide with the highest number of adult medflies emerging in the orchards.

Current Research in Food Safety

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Abraham, K., Wöhrlin, F., Lindtner, O., Heinemeyer, G., and A. Lampen. 2010. Toxicology and risk assessment of coumarin: Focus on human data. 54:228-239.

Coumarin is a naturally occurring phytochemical present in many plants, and is found in some commonly consumed spices and extracts. Coumarin is also hepatotoxic and carcinogenic. The authors review human and animal clinical studies and survey data to assess the likelihood of overexposure. The review concludes that the most nutritional exposure in Germany is likely due to cassia cinnamon consumption. They find that coumarin exposure from cassia cinnamon is safely below the TDI (tolerable daily intake), except in cases of very high consumption or in a sensitive subpopulation
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discovered during clinical studies.

Chang, S.-S., Han, A. R., Reyes-De-Corcuera, Powers, J. R., and D.-H. Kang. 2010. Evaluation of steam pasteurization in controlling *Salmonella* serotype Enteritidis on raw almond surfaces. 50:393-398.

The authors assess the utility of steam in reducing the salmonellosis-causing Salmonella on inoculated shelled almonds using a custom-designed apparatus. A 5-log reduction was observed in both almonds inoculated with a *Salmonella*Enteritidis cocktail and almonds inoculated with a single strain, *Salmonella* Enteritidis PT 30. This reduction occurred when the almonds were exposed to 25 seconds at 143 kPA. Longer steaming reduced *Salmonella*Enteritidis further, but caused wrinkling and discoloration of the nuts.

Current Research in Plant Biotechnology

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Abdeen, A., Schnell, J., and B. Miki. 2010. Transcriptome analysis reveals absence of unintended effects in drought-tolerant transgenic plants overexpressing the transcription factor ABF3. 11:69.

Plants engineered for drought-tolerance and other abiotic stress tolerances are highly commercially desirable. Genetic engineering of such complex traits, however, may introduce pleiotropic effects in the transgenic plant. Whereas position effects are result of gene interruption at the locus of insertion, and vary among each plant line, pleiotropic effects represent all of the phenotypic effects resulting from transgene expression, and are insertion site-independent. In this paper, the authors assesses what, if any, pleiotropic effects were present in the model plant system Arabidopsis thaliana engineered for drought-tolerance. Using the Cre/lox recombination system, which allows for selective gene excision, the authors were able to create control plants that had T-DNA insertion sites identical to those with drought-tolerance genes in place. The authors found that little to no pleiotropic effects resulted from drought-tolerance gene expression.

Pardo, J. M. 2010. Biotechnology of water and salinity stress tolerance. 21:1-12.

Sixty percent of the average worldwide crop yield losses are due to environmental factors; of these abiotic stressors, water, salinity, and temperature stress affect plant growth the most frequently and severely. In this review paper, the author focuses on molecular genetics research in water- and salinity- tolerance in model plants. Advances in our understandings of abscisic acid (ABA), a vital phytohormone involved in water loss, are presented. Current research on sodium ion transport and salinity-tolerance are also summarized.

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