

**REPORT ON THE XIth INTERNATIONAL PLANT VIRUS EPIDEMIOLOGY SYMPOSIUM – Plant Viruses: Exploiting Agricultural and Natural Ecosystems -, held together with the PLANT VIRUS ECOLOGY NETWORK. CORNELL UNIVERSITY, ITHACA, NEW YORK, USA. 20-24, 2010**

**This great International Symposium was held on June 20-24, 2010 at the Campus of Cornell University, New York, USA.** This Symposium was the 11<sup>th</sup> of a series of international symposia held under the auspices of the Plant Virus Epidemiology (IPVE) Committee (<http://www.isppweb.org/ICPVE/>), which is part of the International Society of Plant Pathology. This time, the IPVE Symposium was held and organized together with the Plant Virus Ecology Network (PVEN), an NSF-funded Research Coordination Network ([http://bioinfosu.okstate.edu/pve\\_rcn/PVENhome.html](http://bioinfosu.okstate.edu/pve_rcn/PVENhome.html)). This joint effort was very successful as both working groups share common interests, allowing interactions in the field of plant virus epidemiology and virus ecology in both agricultural and natural ecosystems. The main symposium organizer was Stewart Gray, with help from Keith Perry, Sunny Power, Brian Nault and Marc Fuchs (Cornell University, USA).

The Symposium covered the following 4 sessions: (1) Virus Epidemiology and Etiology, (2) Virus Ecology and Evolution, (3) Vector Biology and Virus Transmission and (4) Virus Disease Management, Detection and Diagnosis. All contributions were organized in a series of 45-min KeyNote presentations and 30 min invited talks as well as a number of 15-min oral presentations, poster exhibitions and 5min-poster advertisements.

The symposium was attended by 150 participants coming from the five continents and was sponsored by both IPVE and PVEN groups, as well as other institutions and private companies: USDA, Cornell University, Agdia Inc., Dow Agrosciences, Nichimo America and Syngenta Crop Protection.

The programme started on *Sunday 20<sup>th</sup> June* with registration and a welcoming reception and dinner at the Appel Commons building in the Cornell North Campus

On *Monday 21<sup>st</sup> June* the opening session started with introductory talks by Stewart Gray, Carolyn Malmstrom (PVEN) and Alberto Fereres (Chairman of the IPVE Committee). Then, the first keynote talk by Mike Jeger from Imperial College, London presented a very interesting talk on how plant virus and vector models need to be linked for a full understanding of plant virus epidemiology. He discussed how vectors respond to different cues derived from plants, natural enemies and other environmental factors that directly affect the temporal and spatial scale pattern of plant disease dynamics. The rest of the day the session covered a presentation on the epidemics of cassava mosaic begomovirus and cassava brown streak ipomovirus in East Africa presented by James Legg (IITA, Tanzania). The differences observed in the temporal and spatial patterns of spread of both viruses were associated to variations the mode of transmission and in the population density of its vector, *Bemisia tabaci*. Additional invited presentations covered studies on the molecular epidemiology of potyviruses infecting cucurbits in France to explain why new emerging virus strains are commonly replaced in south-eastern France (Cecile Desbiez; INRA, France). This talk was followed by a presentation by Roger Jones (Perth, Australia) on the epidemiology of *Zucchini yellow mosaic virus* and the effectiveness of non-host plant barriers and other integrated management practices used to reduce disease incidence in cucurbits in Western Australia. Albert Culbreath (U. of Georgia, USA) presented the results of field studies on the epidemiology and disease management

strategies for *Tomato spotted wilt virus* infecting peanuts grown in southeastern United States. The session was completed by a very comprehensive presentation by Nilsa Bosque-Perez (U. of Idaho, USA) on the influence of virus-induced changes in plants on aphid vectors and their impact on plant virus epidemiology.

On Tuesday 22nd June the session theme was 'Virus Ecology and Evolution'. The Keynote presentation was on the community ecology of Barley/cealeal yellow dwarf viruses in Western US grasslands (Alison "Sunny" Power, Cornell Univ. USA). Sunny explained how different biotic and abiotic factors affect virus prevalence on annual and perennial grasses. Then, William Schneider (USDA, USA) explained how aphids might assist the evolution of Soybean dwarf luteovirus when allowed to provide constant selection pressure. The plant-virus-co-evolution of the most prevalent viruses in six wild populations of *Arabidopsis thaliana* in Central Spain was the topic covered by Fernando Garcia-Arenal (U. Politecnica de Madrid, Spain). Then, Marilyn Roossinck presented her studies on a survey and phylogeny of wild plant viruses collected in the region of Tallgrass Prairie Preserve, Oklahoma and the Area de Conservacion de Guanacaste, Costa Rica. Jan Kreuze (CIP, Peru) presented their results of a new technique based on deep sequencing to rapidly identify novel viruses in plants. The invited presentations on virus ecology ended with a presentation by Patrick Cronin (U. of North Carolina, USA) on how host physiological phenotype can predict some epidemiological parameters (susceptibility to infection, competence to infect vectors, and ability to support vector populations). At the end of the day there were two Business Meetings held independently for IPVE and PVEN. The Chairman of IPVE presented an offer by Elsevier to prepare a Special Issue of invited articles to be published in the journal "Virus Research" covering the different themes included in the Symposium. There was also an open discussion to select candidates to act as new representatives of the Committee. The venues and volunteers for organizing the next IPVE Symposium (France, UK and Tanzania) were also presented.

On Wednesday 23<sup>rd</sup> June the session covered several presentations on Vector Biology and Virus Transmission. The keynote address was on the interactions between the non-circulative virus, *Cauliflower mosaic virus*, its aphid vector and their shared host plant (Stephane Blanc, INRA, France). The exact anatomical structure of the common duct within the aphid maxillary stylets that acts as a receptor to the virus helper proteins was described. He also described recent findings on how the virus optimizes its accessibility to the vector within the infected cells. This talk was followed by the description of an aphid gut binding peptide that interferes with the entry of *Pea enation mosaic virus* into the hemocoel (Bryony Bonning from Iowa State U., USA). In her talk she explained how the peptide binds to the midgut and hindgut of the pea aphid reducing the uptake of the virus into the hemocoel. The interactions between grapevine leafroll-associated viruses and their mealybug vectors was presented by Rodrigo Almeida (U. of California, Berkeley, USA) followed by studies on the impact of an elevated concentration of CO<sub>2</sub> on the infection by *Cereal yellow dwarf virus*, the population dynamics of its aphid vector *Rhopalosiphum padi*, and its host plant, wheat (Piotr Trebicki, DPI, Australia). The retention sites of criniviruses within the foregut of its vector, *Bemisia tabaci* was the topic addressed by James Ng (U. of California, Riverside, USA). Drake Stenger closed the session presenting a talk about the polymorphism of a phytoreovirus transmitted by the glassy-winged sharpshooter, *Homalodisca vitripennis*.

On Thursday 24th June the session theme was 'Virus Disease Management, Detection and Diagnosis'. Keynote presentation was on the clean seed programs in Kenya, stressing the importance of producing virus-free seeds in Africa, and the ways that farmers are engaged with the private sector to build up together clean-seed programs (Ian Barker, CIP, Nairobi, Africa). Then, a presentation by Jari Valkonen (U. of Helsinki, Finland) addressed the topic of Cryotherapy of shoot tips as an efficient means for virus and phytoplasma control and healthy plant production in several crops. Then, Scott Adkins (USDA, FL, USA) presented a talk on the ecology and management of whitefly-transmitted vegetable viruses in Florida. The combination of natural and engineered resistance to control rhizomania in sugar beets was the theme addressed by Britt-Louise Lennefors (Syngenta Corp. Sweden). Renato Resende (U. de Brasilia, Brazil) presented his work on the development of broad, stable and durable resistance to begomoviruses in Brazilian tomato lines. Finally, the session ended on studies about the flights and dispersal biology of the soybean aphid as a mean to increase the effectiveness of foliar protectants and reduce the incidence of PVY in potato (Russell Groves, U. of Wisconsin, USA).

This eleventh in the series of International Symposia on Plant Virus Epidemiology was very well organized, maintaining the high standards set by past meetings of the IPVE. Stewart Gray and his team are to be congratulated over a job well done.

Alberto Fereres  
23/09/10