

RGC 7

7th International
Rosaceae
Genomics
Conference



June 24-26, 2014
Seattle, Washington, USA

Program and Abstracts



Fifteen Minute Oral Presentation Abstracts

Genetics to Breeding, Part I

Mapping loci for pest and disease resistance and hybrid necrosis in pear

Sara Montanari¹, Laure Perchepied², H  l  ne Muranty², Philippe Robert³, Vincent Bus⁴, Lester Brewer⁵, Mickael Malnoy¹, Sue Gardiner⁶, Riccardo Velasco¹, David Chagn  ⁶, Charles-Eric Durel²

¹Fondazione Edmund Mach, San Michele all'Adige, Trento, Italy; ²Institut National de la Recherche Agronomique (INRA), Beaucouz  , France; ³AgroCampus-Ouest, Angers, France; ⁴The New Zealand Institute for Plant & Food Research Limited, Havelock North, New Zealand; ⁵The New Zealand Institute for Plant & Food Research Limited, Motueka, New Zealand; ⁶The New Zealand Institute for Plant & Food Research Limited, Palmerston North, New Zealand

Abstract:

We present our findings on genetics of resistance to fire blight (caused by the bacterium *Erwinia amylovora*) and psylla (*Cacopsylla pyri*) in a pear inter-specific segregating population between P128R068T003 (*Pyrus x bretschneideri* X *P. communis*) and 'Moonglow' (*P. communis*). Asian pears are usually less susceptible to psylla than their European relatives and P128R068T003 was previously demonstrated to be a source of resistance to *C. pyri*. The other parent, 'Moonglow', originated from five *P. communis* cultivars, and we demonstrated 'Roi Charles W  rtemberg' to be the source of fire blight resistance. We performed the phenotyping of P128R068T003 x 'Moonglow' population at INRA in Angers (France) and detected Quantitative Trait Loci (QTLs) for both fire blight and *C. pyri* resistance. Amongst the progenies of this cross, we also observed some instances of hybrid necrosis. This phenomenon is caused by epistatic interactions between genes that have deleterious effects in the hybrid, resulting in dwarfism, tissue necrosis and in some cases lethality. This type of genetic incompatibility has been observed in several plant species and has been known for a long time by plant breeders. We were able to collect leaf samples from the seedlings showing the hybrid necrosis phenotype, scan them with molecular markers using the High Resolution Melting (HRM) technique and identify, for the first time in pear, some of the genomic regions where the lethal genes are located.

Keywords: pear, resistance, fire blight, *Cacopsylla pyri*, hybrid necrosis