

# Abstracts of XIII Eucarpia Symposium on Fruit Breeding and Genetics

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**EUCARPIA FRUIT SECTION**

**THIRTEENTH EUCARPIA SYMPOSIUM ON FRUIT  
BREEDING AND GENETICS**

**Warsaw, Poland, September 11-15, 2011**

**Department of Pomology, Warsaw University of Life Sciences (WULS – SGGW)  
and the Committee of Horticultural Sciences of the Polish Academy of Sciences**

## APPLECLIM PROJECT: INNOVATIVE APPROACHES TO DEVELOP APPLE CULTIVARS ADAPTED TO THE SOUTHERN-BRAZILIAN CLIMATIC CONDITIONS

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In the Brazilian apple production regions, usually occurs insufficient chilling exposure as well as temperature fluctuations during winter dormancy. These unfavorable climatic conditions tend to be intensified considering to global warming predictions. The purpose of the project is to gather data and knowledge about how bud dormancy is genetically and physiologically controlled and to generate biotechnological tools applied to conventional breeding in order to accelerate the generation of adapted cultivars. Employing a multidisciplinary approach, bud samples treated for different regimes of temperatures are being used for global gene expression analysis, 2D proteomic analysis followed by mass spectrometry, LC-MS-MS metabolic profiling and modeling of the dormancy process under Brazilian climatic conditions. High-throughput regeneration and gene-delivery systems to apple scion and rootstocks are also being developed. *In silico* analyses and linkage mapping data to identify candidate genes for important processes, such as growth and developmental transitions control, are also underway. In order to develop new apple varieties displaying low chilling requirements and disease resistance, 15.000 to 20.000 seeds are being obtained bi-annually. Following diseases inoculations, the remainder seedlings populations are evaluated in the field for climatic adaptation, vigor and juvenility. The pre-selections grafted on M-9 rootstock are being evaluated for red-skin color, sweet flavor and long storage capacity as the main attributes for fruit quality. From the 64 selections under evaluation, 45 are being tested on a regional network collection scheme, to allow selection for good local climatic adaptation, disease resistance, yield and fruit quality. During the project, the new variety Monalisa was released, a low chilling and multi-resistant one, carrying the *Vf* scab resistance allele, high resistance to *Colletotrichum gloeosporioides* and to European red spider mite and good tolerance to both mildew and bitter rot. This cultivar produces fruits of outstanding skin finish and very well flavor balance.