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Strategies for the genetic transformation, via organogenesis, of *Prunus* spp. to induce resistance to *Plum Pox Potyvirus* (PPV) through post-transcriptional gene silencing

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Stone fruits, especially peach (*Prunus persica*), are among the most important tree species grown in the Mediterranean basin, subjected to viral infections. In particular *Plum Pox Virus* (PPV), the etiologic agent of Sharka disease, leads to significant agronomic and economic losses. At the moment there are only means of prevention against such infection, which are often not effective and associated to environmental sustainability issues and costs for farmers. Furthermore, traditional breeding techniques present many limitations when applied to the genus *Prunus*: the difficulty of finding genetic sources of resistance, time-consuming and introgression of agronomically negative traits. A possible integrative strategy is to genetically transform plants to induce virus resistance through post-transcriptional gene silencing mechanism (PTGS). Until now, the application of genetic transformation techniques in peach has been limited by the difficulties in developing efficient regeneration and transformation protocols. A new efficient protocol for *in vitro* regeneration (Mezzetti et al., 2002), via organogenesis, was efficiently transferred from grape to a peach cultivar (Big Top) and rootstock (GF677). Both *Agrobacterium tumefaciens*-mediated and direct biolistic transformation strategies were applied to this regeneration process. The transformation experiments were conducted using hairpin genetic constructs for the induction of PPV resistance through the mechanism of PTGS. Thin layer tissues from meristematic bulks were able to regenerate on selective media after mediated and direct transformation, and GUS transient transformation events were detected after biolistic treatments. Molecular analyses (PCR and Southern) allowed to identify new transgenic events of GF677.

Biography

Mezzetti B is a Professor in Fruit Crop Breeding and Biotechnology (AGR03), Department of Environmental and Crop Science (SAPROV), Marche Polytechnic University-Ancona (IT). Director of the Department of Agricultural, Food and Environmental and Crop Science, Marche Polytechnic University. Chairman of the first and second level degree courses in Agricultural Science and Technology Local Coordinator of the UNIDO Long Distance Second Level GMO Biosafety.Faculty Delegate of the ERASMUS program. Responsible of the teaching courses on Fruticulture breeding, biotechnology.

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