

## **IN VITRO SCREENING FOR RESISTANCE TO APPLE PROLIFERATION IN ROOTSTOCK BREEDING MATERIALS**

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A breeding program was started six years ago in Trentino region within the Project Scopazzi del Melo – Apple Proliferation (SMAP) in order to obtain AP resistant apple rootstocks suitable to modern fruit growing. Twenty cross combinations used *Malus sieboldii* and its hybrids with *M. domestica* as donors of the resistance trait. Despite different degrees of apomixis and polyploidy, 3300 individual plants were obtained, even though not all were genuine hybrids. Seedlings were successfully analysed with molecular markers and flow cytometry so that mode of reproduction, genomic constitution and ploidy level were inferred. Sets of 5-6 locus specific microsatellite markers right for characterizing each progeny were applied. A screening system for AP resistance was developed, based on *in vitro* graft-inoculation with the causal agent ‘*Candidatus Phytoplasma mali*’. The phytoplasma concentration in inoculated shoots was determined at different times post-inoculation by quantitative real-time PCR. All infected resistant parents had lower phytoplasma concentration than the susceptible controls. They did not show AP-specific symptoms and their growth was not affected. The resistant behaviour of *M. sieboldii* and some of its hybrids (H0909, D2212) infected with two different strains (PM4 and PM6) was confirmed *in vitro*. Preliminary results show that resistance trait segregates in the progenies.