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(22nd SPPS Meeting)

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Cryopreservation of apple

PP3-19

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In this work we employed two vitrification-based techniques (vitrification and droplet vitrification) to cryopreserve *in vitro* grown shoot tips of apple 'Gala Must' (*Malus* × *domestica* Borkh.). After preculture, shoot tips were osmoprotected at room temperature in a solution containing 2 M glycerol and 0.4 M sucrose for 20 min, and then dehydrated in the following plant vitrification solutions: PVS2 (13.7% sucrose, 30% glycerol, 15% ethylene glycol, 15% DMSO), PVS A3 (22.5% sucrose, 37.5% glycerol, 15% ethylene glycol and 15% DMSO) for 30, 40 and 50 min at 0 °C and PVS3 (50% glycerol and 50% sucrose) for 40, 50 and 60 min at room temperature. Explants dehydrated with PVS2 and PVS A3 were cryopreserved by vitrification while those dehydrated with PVS A3 and PVS3 were cryopreserved using droplet vitrification. In vitrification protocol, regrowth of the cryopreserved shoot tips dehydrated with PVS2 ranged between 20–40%. Dehydration with PVS A3 resulted in considerably higher regrowth rates (15–75%) using the same protocol. The highest values of regrowth were achieved with the longest treatment duration (50 min) for both vitrification solutions. As for droplet vitrification, regrowth of cryopreserved explants dehydrated with PVS A3 varied between 45–70%, and between 45–50% for those dehydrated with PVS3. The highest regrowth values, 70% and 50%, were achieved after 40-min PVS A3 treatment and 50-min PVS3 treatment, respectively. These results prove the feasibility of the PVS A3-based vitrification for the long-term storage of this genotype.

Keywords: *Malus* × *domestica* Borkh., vitrification, droplet vitrification, liquid nitrogen

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Seasonal variability in leaf chemistry of *Iris variegata* L. genotypes growing in contrasting light conditions

PP3-20

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During their evolution plants developed a set of mechanisms to adapt to the varying environmental conditions. Light is one of the most dynamic components of the terrestrial environment that affects plant physiology and development. Optimization of light harvesting for photoautotrophic growth inevitably induces specific adjustments in all aspects of plant phenotype: morphology, anatomy, phytochemical composition, flowering phenology etc. As sessile organisms capable of perceiving quantitative and qualitative features of light surroundings, plants need to be particularly plastic in their response to different light environments. For this study genotypes of

Iris variegata that occupy different light habitats in Deliblato sands were selected: a) open habitats where they were exposed to full sunlight and b) woodland understories with lower light intensity and changed light quality (vegetative shade). Specimens of those *I. variegata* genotypes were grown under two experimental light treatments: 1.) high intensity and higher red-far red light ratio and 2.) low intensity and lower red-far red light ratio. Leaves were collected during spring, summer and autumn of one experimental year, dried in silica gel and extracted with methanol. Samples were subjected to UHPLC/qqqMS profiling of phenolics (phenolic acids, flavonoids, and xanthones), and subsequently to chemometric analysis. Results showed that dissimilar light conditions in applied treatments markedly affected *I. variegata* phenolics composition. Repeated measures model ANOVA revealed a significant effect of seasons for all analyzed phenolics. Concentrations of half of the analyzed chemical compounds were significantly different under two light treatments. The correlations between traits were in almost all cases significant and positive.

Keywords: secondary metabolites, light treatments, *Iris variegata*, Deliblato sands

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