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In Vitro Propagarion and Cryopreservation of Important Grape Cultivars (*Vitis Vinifera* L.) and Rootstocks

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Grape (*Vitis vinifera* L.) is among the most important species that is cultivated almost all around the world. There are over one thousand varieties that are grown for raisin, fresh consumption and wine making purposes. The grape germplasm resources are generally maintained as whole plants under field conditions. The traditional way of germplasm preservation is very risky due to natural uncertainties. *In vitro* technologies can help producing healthy propagation materials free from viroids, viruses, bacteria, phytoplasmas, fungi, and nematodes. When combined with cryopreservation technologies *in vitro* preservation systems can allow safe protection and propagation of valuable *Vitis* genetic resources. In this study, 12 commercial cultivar and two rootstock materials were tested for the applicability of long term preservation by *in vitro* clonal propagation and cryopreservation techniques. Axillary shoot tips collected from newly emerging shoots were placed in Magenda boxes containing 30 g/l sucrose on MS medium and cultured in a growth chamber adjusted to 16 h ligth/25^{o} C and 8 h dark/17^{o} C. All grape genotypes tested responded well to this application and produced healthy root and shoots. Shoot explants from these *in vitro* stocks were subcultured in every three months for one year. Apical dome explants excised from *in vitro* grape plants were stored in liquid nitrogen for cryopreservation. Genotypes varied in their responses to cryopservation treatment. Five genotypes showed shoot or callus formation. Regenerated shoots continued to grow and produced normal shoots and roots, but no plants could be developed from calli. Flow cytometry analysis of regenerants from continuous subculture and cryopreservation did not show any chromosome number abnormalities. *In vitro* micropropagation is an excellent choice for a long-term conservation of grape germplasm, which allows access to actively growing plant materials without seasonal restriction. Such cultures are excellent sources for cryopreservation and for production of disease-free propagation material.

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