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RESEARCH PAPERS

Effect of Dehydration Duration of Apices on Characteristics of In Vitro Plants of *Fragaria vesca* after Cryopreservation

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Abstract—Effect of different duration of dehydration of the apices isolated from in vitro plants on genetic stability was investigated in regenerated plants of wild strawberry (*Fragaria vesca* L., var. *alpine*) recovered after cryopreservation according to a precultivation-dehydration protocol. Plant material belongs to a clone (cv. Reine des Vallees) that has been maintained in vitro for more than 25 years in Timiryazev Institute of Plant Physiology. It was shown that duration of desiccation the apices before freezing appreciably affected the rate of postcryogenic recovery of plant growth and coefficient of their subsequent propagation. After 5-h-long desiccation, apices were notable for the highest growth rate. The plants restored from such apices also had the highest coefficient of propagation. For DNA analysis, the samples of leaves were taken separately from each plant after hardening and after cryopreservation. According to the results of RAPD, ISSR, and REMAP analyses, the plants from the chosen clone of strawberry showed some genetic variation prior to cryopreservation (percentage of polymorphic fragments was 9.0%). Plant adaptation to cold did not change the level of genetic variation. Among postcryogenic regenerants, morphologically modified plant forms were not observed, with the level of DNA marker variation decreasing almost two times irrespective of the duration of dehydration. However, in one plant restored after 5-h-long dehydration and cryogenic freezing, a 1200 bp fragment of DNA was lacking, which was detected in all other examined samples (frequency of deviation was 0.9%). Earlier, we did not reveal plant polymorphism of investigated strawberry clone associated with this fragment. Probably, this modification of DNA resulted from the exposure of plant material to dehydration and freezing in liquid nitrogen.

Keywords: Fragaria vesca, cryopreservation, dehydration, genetic stability, RAPD, ISSR, REMAP, stress
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