

THE INFLUENCE OF THE STORAGE TEMPERATURE ON THE SEEDS OF WILD SPECIES. 3. SEEDS WITH MORPHOLOGICAL AND MORPHOPHYSIOLOGICAL DORMANCY

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SUMMARY

The influence of various temperatures on the storage of seeds with morphological (*Anemone sylvestris* L., *Pulsatilla patens* (L.) Mill.), simple (*Angelica archangelica* L., *Asparagus officinalis* L., *Clematis recta* L., *Veratrum nigrum* L.) and complex (*Delphinium cuneatum* Stev. ex DC., *Fritillaria ruthenica* Wikstr.) morphophysiological dormancy for 8 wild species was investigated. The quality of seeds was estimated by means of the dynamic and germination ability assay of freshly-harvested seeds, seeds after cryopreservation in liquid nitrogen ($-196\text{ }^{\circ}\text{C}$) during 1 month, and at 5, -20 , $-196\text{ }^{\circ}\text{C}$ during 3, 6, 9 and 12 years. The development of seedlings from seeds stored during 12 years at these temperatures was observed. Long-term seed storage at $5\text{ }^{\circ}\text{C}$ of all species studied reduces the quality of seeds (germination ability, dynamics of seed germination, seedling quality) in a greater or lesser extent. The short-time cryopreservation does not result in degradation of the quality of seeds for all species studied. The seeds of 8 species stored at subzero temperatures (-20 and $-196\text{ }^{\circ}\text{C}$) retained initial germination ability; seedlings developed normally. We assume that the ability of seeds with morphophysiological dormancy to retain quality upon long-term storage in liquid nitrogen in contrast to seeds with physiological dormancy, which lose their germination rather quickly at ultra-low temperature, may be indicative of different mechanisms involved in viability sustaining for seeds with these different dormancy types. Perhaps, seeds with morphological and morphophysiological dormancy as well as not-dormant seeds survive in a dry state due to general inhibition of metabolism as a consequence of the low hydration. Apparently, embryo hypoplasia in the case of seeds with morphological and morphophysiological dormancy allows to save time so that the development of seeds may be accomplished under ecological conditions essential for the synthesis of sHSPs- and LEA-proteins that impart to seed's cells resistance to dehydration and dry storage.

Key words: wild species, seeds, morphological dormancy, morphophysiological dormancy, germination, storage temperature, cryopreservation.