

**THE INFLUENCE OF THE STORAGE TEMPERATURE ON THE SEEDS
OF WILD SPECIES. 2. SEEDS WITH PHYSIOLOGICAL DORMANCY
IN THE CASE OF *CAMPANULA* (CAMPANULACEAE) SPECIES**

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SUMMARY

The influence of various temperatures on the storage of seeds of 5 *Campanula* L. species was studied. The seed quality was estimated by the ability and dynamics of germination of freshly harvested seeds: after cryopreservation in liquid nitrogen (–196 °C) during 1 month and at 5, –20 (3 species) and –196 °C for 3, 6 and 9 years. *Campanula* species were ranged according to the deepening of the physiological dormancy: *C. persicifolia* L., *C. rapunculoides* L., *C. trachelium* L., *C. bononiensis* L., *C. latifolia* L. During 9 year storage at 5 °C, dynamics and germination ability did not changed in the seeds of 4 species; the germination ability of *C. latifolia* seeds increased at first due to the dormancy overcoming then decreased to initial value. The storage at –20 °C caused the impairment of germination dynamics of *C. trachelium* seeds, of *C. bononiensis* seed germination; the germination ability of *C. latifolia* seeds increased at first due to the dormancy overcoming then decreased to singular. At –20 °C the overcoming of physiological seeds dormancy as well as aging involved oxidative stress. The short cryopreservation didn't cause the degradation of seed quality of all studied species.

After the 9-year storage in liquid nitrogen, the seed quality maintained in *C. persicifolia* and *C. rapunculoides*, the dynamics of seed germination went down in *C. trachelium* and *C. bononiensis*, seeds of *C. latifolia* almost lost germination. The quality of seeds declined gradually, i.e. the aging continued at –196 °C. This effect could be caused by the influence of background radiation on the biomembranes dehydrated by ultra low temperature and lack of Late Embryogenesis Abundant (LEA) proteins, since these proteins stabilized membranes and macromolecules, provided antioxidant protection of cell components under conditions of water deficit.

The deeper was the seed dormancy of *Campanula* species, the faster they aged at ultra-low temperature, since, probably, the depth of physiological dormancy reflected the insufficient quantity or incomplete functional range of LEA-proteins, that were produced at the latest stages of seed maturation.

Key words: *Campanula*, seeds, physiological dormancy, germination, storage temperature, cryopreservation.