THE DEPENDENCE OF SEED VIABILITY FROM ACTIVATED PHYTOCHROME SYSTEM

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Degradationofseed viability is occurredduring prolonged seeds storage. This prosesmanifests in the reduction of germinative energy, laboratory and field germinating ability, growth rate of seeds. It is of great importance during long-term storage of seeds in genetic banks of plants. It is known that exposure of seeds byemissionof the red spectral region with λ = 660 nm and λ = 730 nm activates phytochromessystem and as result regulates the growth and development of plants. It was revealed that activated phytochrome increases (to 26%) seed germinating ability of cress, which was lost as a result of artificial aging.Therefore, the task of our workwas researching the seedsemergenceunder the influence of the wavelength in the red spectral region.Seeds, which we used in our research, have been dormant for several years and has lost the normal ability to emergence.

Seeds of barley (variety Dzherelo) were exposuredby 660 nm,730 nm and sequentially 660 nm and 730 nm.As s control were used non-exposured seeds. The exposure was carried after a two-hour soak during 10 minutes by photon matrix which was consistedfrom 24 light-emitting diodes(LEDs). The exposure was carriedwithout entrance of the light, above the germination dish with sprouts. The number of germinated seeds was counted after 3 days and then every 24 h. the Results were processed statistically.

The obtained data reveals that in all variants during the experiment the number of germinated seeds increases. At the beginning of the experiment, i.e. three days after exposure, the lowest level of germination was variantof 660 nm + 730 nm. Higher level in the controlvariant, and variant of 730 nm.The highest level of germination was observed in the variant of the 660 nm. The significant increase in the number of germinated seeds in variantof 660 nm (~27%) agrees well with the literature data about the activation of germination by red light.

In the variant of sequentialexposure by 660 nm and 730 nm – the wavelength 730 nmabandons the action of the 660 nm and suppresses seed germination (by~55%). The wavelength 730 nm not only delayed germination, but even a few activated it (~12%). This may be due to the formation intermediate forms of phytochrome under the treatment of wavelength 730 nm, what can have a stimulating effect.

Therefore, the conducted research enables to state a factthat the exposure of seeds with red spectral region (λ = 660) improves germination and germinating capacityof barley, contributes to the interruption of dormant state and maybe activates enzymatic processes associated with nutrient mobilization.