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DETERMINING THE STORAGE POTENTIAL OF *Trigonella foenum- graecum* SEEDS DURING *ex situ* CONSERVATION

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In the *ex situ* conservation of plant germplasm in gene banks, the primary objective is to maintain seed viability, since seeds gradually lose their germination capacity and genetic uniformity as a result of aging. Therefore, determining a comprehensive indicator such as seed storage potential (SP) is a very important step for the successful *ex situ* conservation of plant genetic resources. SP was determined using an accelerated aging (AA) test, in which seeds are exposed to conditions of elevated temperature and high relative humidity for a short period of time. It allows for the monitoring of gene pool samples-that is, for the continuous assessment of seed viability and the classification of genotypes from active collections based on seed aging parameters. The test allows for: identifying samples unsuitable for long-term storage, providing recommendations on seed reproduction timelines, and indicating the need to restore the viability of valuable sample. The experiments were conducted on fenugreek (*Trigonella foenum-graecum*) seeds. Two genotypes were studied: *MDIT 052637 and MDI 00934.* The aim of the study was to examine the morphophysiological and biochemical parameters of the seeds and seedlings following the AA test. For fenugreek seeds, it is recommended to conduct the AA test at an air temperature of 42°C, relative humidity of 80.0–90.0%, and an aging period of 72 hours. For our samples, a different aging temperature was selected: 43°C, and a different aging period: 48 hours. Control: fenugreek seeds from the most recent generation. After the AA test, the seeds' germination energy (GE), germination rate (G), root length (RL), fresh (FB) and dry (DB) root biomass, and peroxidase (PO) activity in the roots of the seedlings were determined. Electrolyte leakage (EL) was determined by the electrical conductivity (EC) of solutions containing normal and aged seeds after 2 soaking durations: 24 and 48 hours. After conduction AA-test, a

decrease in GE and G of the seeds was observed compared to the control; for both genotypes, the values after AA were 30.0% and 34.5% and 49.3% and 52.5%, respectively, while the decrease in GE was 19.0% and 17.2%; in the control, G was 98.8% and 97.3%. The G of the seeds after the test decreased by a factor of 2.0 and 1.9 times, respectively. The RL after AA-test decreased by 4.8 and 4.3 mm compared to the control (RL in the experiment: 10.0 and 10.9 mm; control: 14.8 and 15.2 mm). The decrease in RL compared to the control was 1.5-fold and 1.4-fold. After AA-test, a decrease in root FB for the two genotypes was observed, amounting to 140.0 and 130.0 mg, respectively, compared to the control, while DB decreased by 35.0 and 30 mg, respectively. EL was determined at two soaking durations: 24 and 48 hours. An increase in the EC of the solutions after AA-test compared to the control was observed at both soaking durations. For the 24-hour exposure, the EC of solutions containing aged seeds increased by 5.0 and 6.0 mS/m compared to the control, and for the 48-hour exposure, it increased by 8.0 and 7.5 mS/m. PO enzyme activity increased 1.6 - and 1.75 - fold after AA-test compared to the control, i.e., the response to thermal stress was significant (control – 0.210 and 0.200 u.e., experiment – 0.335 and 0.350 u.e.). New conditions for the AA-test of fenugreek seeds were proposed: air temperature – 43°C, aging period – 48 hours. The seed AA-test allows for the determination of their SP, which in turn characterizes the ability of samples from various agricultural crops to undergo long-term *ex situ* conservation in a plant gene bank. The studied fenugreek seed varieties proved to be highly sensitive to the harsh conditions of the AA-test.

Keywords: fenugreek, accelerated aging, gene bank, storage potential

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