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EVALUATION OF ROS ACCUMULATION IN TOMATO ROOTS DURING POSTSTRESS ACLIMATIZATION

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Reactive oxygen species (ROS) fluctuations in time and space can be interpreted as signals to regulate growth, development, cell death and stress responses. The microscopic analysis obtained on 4 tomato genotypes (*S. pimpinellifolium*, Rufina, Mihaela and Mary Gratefully) show that the length of the ROS area accumulations in the root apical meristem decreases significantly in development dynamics - 96, 120 and 144 hours after seed immersion in water and 24, 48, 72 hours poststress (hps). The values of the ROS area length in optimal conditions, 96 hours, varied between 42.5µm (Mary Gratefully) and 30.4µm (*S. piminellifolium*) and for 144 hours decrease down to 22,4 and 2,4 µm, respectively. The heat stress determined a significant decrease of 2-15 times the length of ROS area compared to the control at 24 hps. The same trend for all analyzed terms within the genotype was maintaining except for *S. pimpinellifolium*, in which the length of ROS area increased at 48 and 72 hps, comparing to 24 hps variant. In the case of drought stress, accumulation of ROS was attested at 24 hps only, the other terms no positive histochemical response was recorded for ROS. Stress also causes a redistribution of ROS accumulations in all areas root, in a manner specific to the type of stress and genotype. Elongation of the root at 72 hours post-heat stress indicated higher values for the genotypes that marked and higher indices of the area with ROS accumulations in the following order: Mary Gratefully, Rufina, Mihaela and *S. piminellifolium*.

The analysis of the variance of ROS area length established a significant contribution of all analyzed factors and their interaction, the highest share of variation being due to *stress* (17%), *hours poststress* (13%), their interaction (11%), and of *genotype* (9%).

Evaluation of root cell viability by Evans Blue test established that germs exposed to heat or drought stress, compared to the optimal variant, microscopically marked penetration of the reagent in almost all meristem area at all evaluation terms -24, 48 and 72 hps. Thus, inhibition of main root growth under stress as result of loss cell integrity in the meristematic zone was accompanied by stimulation of adventitious root growth, which could be marked by ROS accumulations in the tip of adventitious roots, and their location was in the immediate vicinity of the meristematic area compared to their location in the differentiation zone in the optimal conditions. Morphological analyzes established differences in root architecture of plants exposed to heat or drought and optimal conditions according to the length of the main root, the number, length and location of secondary roots. Drought and heat stress applied at the germination stage drastically change the root parameters, which can have repercussions on further plant development.

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