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ASSESSMENT THERMOTOLERANCE IN TOMATO PROGENY AT THE SEED GERMINATION STAGE

BULDUMAC Ana*, https://orcid.org/0000-0002-9674-0403
ANDRONIC Larisa, https://orcid.org/0000-0002-2761-9917
SALTANOVICI Tatiana, https://orcid.org/0000-0002-1122-7433
ANTOCI Ludmila, https://orcid.org/0009-0006-4855-6544

Moldova State University, Institute of Genetics Physiology and Plant Protection, Chisinau, Republic of Moldova,
**Corresponding e-mail: ana.buldumac@sti.usm.md*

Temperature is known to be a key factor determining plant development from germination through to reproduction, while also influencing various physiological and adaptive processes. During the seed germination stage, temperature plays a significant and specific role by affecting both the rate and success of the processes, thus facilitating the differentiation and identification of genotypes with varying levels of heat tolerance. The objective of the research was to identify heat-resistant genotypes at the seed germination stage among tomato progenies obtained through cellular techniques. The study included the tomato cultivars Elvira, Rufina and the wild species *Solanum pimpinellifolium*, as presented into 27 experimental variants: control, infected with TMV/TAV, and treatments with glycosides (Moldstim, Glycoside V). During the study, 5400 seeds were evaluated. Based on the observed variability of biomorphological indices at the seed germination stage, the heat resistance level of the genotypes was determined, ranging from 46.6...81.3 %. Thus, regarding the genotypes derived from plants treated with Moldstim, we observed increased heat resistance compared to the control in 44.0 % of cases, whereas heat resistance decreased in over 50 % of cases. Among the progeny of plants sprayed with Glycoside V, we observed stimulatory effects and neutral reactions in 88 % of cases. Across the genotypes not treated with glycosides, the highest level of resistance – 66.8 % was observed in the Rufina variety, whereas for the other genotypes, values for this trait ranged from 54.7...56.6 %. The action of the glycosides resulted in positive effects in the progeny of the Elvira variety treated with Glycoside V (4.5 %) and in the wild species *Solanum pimpinellifolium* (treated with Moldstim/Glycoside V) – 5.2…7.4 %.

Statistical analysis of the data obtained through multifactorial analysis of variance helped identify the sources of variation determining the variability of the stud-

ied traits. As a result, the decisive role of the genotype in the variation seeds heat resistance was established for the genotypes in control, TMV, TAV treatments, a finding of potential importance for elucidating the genetic basis of the studied genotypes and for breeding programs, whereas the effect of the glycoside was 6.8…7.5 times lower. The analysis of the sources of individual variation for each genotype showed that viruses made the greatest contribution in the cultivar Rufina and the wild species *S. pimpinellifolium*, whearest the effect of glycoside was 2.9…6.8 times weaker. For the Elvira cultivar, the impact of viruses and the glycoside was lower – 37 and 25.0 %, the interaction of these factors was quite high (32.8 %), indicating a broad reaction norm for this trait. Among the genotypes included in the study, the TMV/TAV descendants of the Rufina cultivar stood out with the highest levels of heat resistance: 61.9…81.3 %.

Consequently, tomato progeny derived from plants with differing phytosanitary status at the seed germination stage are characterized by a relatively high level of heat resistance, ranging from 46.6…81.3 %. Progeny of the Rufina TMV/TAV cultivar exhibited the highest values for this trait – 61.9…81.3 %. Variation in heat resistance was primarily controlled by the genotype, a finding that may be significant for elucidating the genetic basis of the studied genotypes and for breeding programs. Compared to the control, application of Glycoside V elicited positive effects or neutral reactions in 88 % of cases.

Keywords: tomato, thermotolerance, virus infection, glycoside, resistance.

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