Effective Salt Criteria in Callus-Cultured Tomato Genotypes

Mahmut Dogan[a], Rukiye Tıpırdamaz[b], and Yavuz Demir[c,*]

[a] Harran Üniversitesi, Fen Edebiyat Fakültesi, Biyoloji Bölümü, Osmanbey Kampüsü, Sanlıurfa, Turkey
[b] Hacettepe Üniversitesi, Fen Fakültesi, Biyoloji Bölümü, Beytepe Kampüsü, Ankara, Turkey
[c] Atatürk Üniversitesi, K. K. Eî itim Fakültesi, Biyoloji Bölümü, 25240-Erzurum, Turkey. Fax: (+90) 44 22 36 09 55. E-mail: ydemir_409@yahoo.com

* Author for correspondence and reprint requests

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Na^+, Cl^-, K^+, Ca^{2+}, and proline contents, the rate of lipid peroxidation level in terms of malondialdehyde (MDA) and chlorophyll content, and the changes in the activity of antioxidant enzymes, such as superoxide dismutase (SOD: EC 1.15.1.1), catalase (CAT: EC 1.11.1.6), ascorbate peroxidase (APX: EC 1.11.1.11), and glutathione reductase (GR: EC 1.6.4.2), in tissues of five tomato cultivars in salt tolerance were investigated in a callus culture. The selection of effective parameters used in these tomato genotypes and to find out the use of *in vitro* tests in place of *in vivo* salt tolerance tests were investigated. As a material, five different tomato genotypes during a 10-day time period were used, and 150 mM NaCl was applied at callus plant tissue. The exposure to NaCl induced a significant increase in MDA content in both salt-resistant and salt-sensitive cultivars. But the MDA content was higher in salt-sensitive cultivars. The chlorophyll content was more decreased in salt-sensitive than in salt-resistant ones. The proline amount was more increased in salt-sensitive than in salt-resistant ones. It has been reported that salt-tolerant plants, besides being able to regulate the ion and water movements, also exhibit a strong antioxidative enzyme system for effective removal of ROS. The degree of damage depends on the balance between the formation of ROS and its removal by the antioxidative scavenging system that protects against them. Exclusion or inclusion of Na^+, Cl^-, K^+, and Ca^{2+} , antioxidant enzymes and MDA concentration play a key protective role against stress, and this feature at the callus plant tissue used as an identifier for tolerance to salt proved to be an effective criterion.

Key words: Antioxidant Enzyme, Salinity, Tomato