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# Production of Tomato Fruit Containing High Health-Promoting Properties and High Phenolic Compounds Using Salt Stress

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Summary

In the tomato production, salt stress has been applied to improve the organoleptic and health-promoting qualities. However, although many researches about the effects of salt stress on fruit qualities were accumulated, changes in health-promoting quality such as polyphenol content are not conducted. Here we investigate the effect of salt stress on polyphenol content of tomato fruit. Two tomato cultivars used in this study; normal-fruited type 'House Momotaro' (HM) and cherry type 'Mini Carol' (MC). Plants were grown under different salt stress intensities (25, 50, 75, 100 mM) at a closed irrigation system. Red-ripe fruits were harvested on the second truss, and polyphenol and antioxidant capacity were measured. In the HM, polyphenol content on a fresh weight (FW) basis was higher in the 100 mM salt-stressed fruit than in the control fruit. In contrast, in the MC, polyphenol content was not affected by the salt stress. In antioxidant capacity, in the HM, all antioxidant capacities were higher in the 50, 75 and 100 mM salt-stressed fruit than in the control fruit. However, although in the MC, only SRSA was higher in the 75 and 100 mM salt-stressed fruit than in the control fruit. Furthermore, polyphenol contents and antioxidant activities on a dry weight basis were significant lower in the salt-stressed fruit than in the control fruit in the MC fruit, but not in the HM fruit. To visualize the interaction of polyphenol and organoleptic data profiles, by using a network-based analysis, we indicate that salt stress modulates the design principles of interactions, and their interactions depend on cultivars. We concluded that polyphenol content on a FW basis was increased by the salt stress, but the effect largely depends on cultivars. In the physiological mechanism, the higher level of polyphenol content on a FW basis may be contributed to the 'concentration effect', but the lower level on a dry weight basis leaded to regulate of salt-induced metabolic changes.