

Antioxidant Activity (TAA) of Tomato Fruit During Postharvest Storage on Different Temperatures

Zoran ILIĆ¹, Avital BEN-YOSEF², Yaccov PARTZELAN², Sharon ALKALAI-TUVIA², Elazar FALLIK²

¹Faculty of Agriculture, Jelene Anžujске bb, 38228 Zubin Potok, Kosovska Mitrovica, Serbia

²ARO – The Volcani Center, Postharvest Science of Fresh Produce, Israel

Abstract

Changes in total antioxidant activity (TAA) during ripening of tomatoes (*Lycopersicon esculentum* Mill.) were studied at three different ripening stages (mature green-MG, light pink-LP and light red-LR). The TAA of tomato fruits measured by TEAC (Trolox equivalent antioxidant capacity). This assay measures both the HAA-hydrophilic (vitamin C) and LAA-lipophilic (carotenoids and vitamin E) contents based on the total radical scavenging capacity, and the ability of a scavenge the stable ABTS radical (ABTS⁺) described by Vinocur and Rodov (2006). Fruit were stored at 5°C or 12°C during 2 weeks plus 4 days at 20°C (shelf life simulation).

TAA in MG fruit immediately after harvest was 2.05 (0.31 LAA and 1.74 HAA) µmol TE/g fr.wt, in LR ripening stage was 2.25 (0.48 LAA and 1.77 HAA) and in LR stage TAA was 2.52 (0.72 LAA and 1.80 HAA). In tomatoes this ratio (hidrophilic and lipophilic) changed from approximately 1:5 in mature green fruit to 1:3 in light pink one and 1:2.5 in light red one.

After 2weeks storage at 5°C +4days shelf life on 20°C total TAA slowly growing up and obtained content of 2.48 in MG fruit, 2.50 in LP fruit and 2,62 µmol TE/g fr.wt. in LR fruit. This is mainly due to changes in the lipophilic antioxidant activity-LAA, depend of stage of maturity (MG-0.94, LP-0.96 and LR-1.31 µmol TE/g fr.wt). Hydrophilic antioxidant activity-HAA remains practically unchanged comparing with activity on beginning of storage.

In tomato fruit was stored at 12°C the total activity, increased most probably due to the accumulation of carotenoids, especially after shelf life (4 days on 20°C). Those, LAA was 1.14 in MG-fruit, 1.52 in LP-fruit and 1.68 µmol TE/g fr.wt in LR-fruit. In parallel, the total activity, increased from 2.63 in MG-fruit, 3,24 in LP and 3.42 µmol TE/g fr.wt in LR fruit. After storage ratio between hidrophilic and lipophilic activity changed from 1:1,5 in MG fruit to 1:1 in light red fruit.

Key words : storage, tomato, ripening stage, antioxidant, quality

sa2008_a0414