

Title Post harvest dipping of tomato fruits with antioxidants inhibits lipoxygenase and senescence

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Citation Abstracts of 7th International Postharvest Symposium 2012 (IPS2012). 25-29 June, 2012. Putra World Trade Centre (PWTC), Kuala Lumpur, Malaysia. 238 pages.

Keywords tomato; senescence

Abstract

Postharvest application of antioxidants (sodium benzoate @ 500 and 100 ppm, ascorbic acid @ 500 and 1000 ppm and benzyl adenine @ 50 and 100 ppm) on tomato (*Lycopersicon esculentum* Mill cv Rasmi) lipoxygenase activity and subsequent senescence and changes in quality parameters were studied. Various ripening parameters like colour score, lycopene content and senescence parameters like electrolyte leakage and lipid peroxidation and quality parameters like TSS, sugars and ascorbic acid were estimated at regular intervals. Colour index and lycopene content were effectively reduced and days taken for ripening was increased in the fruits treated with benzyl adenine at 25 and 50 ppm and sodium benzoate at 1000 ppm. However, ascorbic acid was not effective in retarding the ripening process. Lipoxygenase (LOX) activity increased from initial day of analysis to 14th day of storage and thereafter decreased till the end of shelf life. Further, the peak LOX activity on 14th day of storage was significantly reduced in the fruits treated with benzyadenine 50 ppm and sodium benzoate 1000 ppm when compared to untreated controls. Subsequently these treatments reduced the relative electrolyte leakage (REL) and lipid peroxidation (LP) over untreated controls. The reduced LOX on 14th day of storage was responsible for reducing lipid peroxidation. The lower lipid peroxidation might have maintained better membrane integrity of reduced relative electrolyte leakage. The catalase activity decreased throughout the storage period in all the treatments. However, the catalase activity was higher in that treatment (benzyladenine @ 50 ppm) which has inhibited the lipoxygenase activity. Thus, in the present study the antioxidant benzyl adenine @ 50 ppm, by effectively inhibiting the LOX activity and maintaining higher catalase activity has inhibited the senescence processes in tomato as evidence by the reduced lipid peroxidation and relative electrolyte leakage.