Effect of High Voltage Electrostatic Field (HVEF) on Ripening and Senescence of Malus domestica cv. and Study on Its Mechanism

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ABSTRACT

Fruit quality deterioration such as tissue and oxidative deterioration with storage time after harvest was due to the oxidative stress and tissue enzyme activation and lead to economic losses. High voltage electrostatic fields (HVEF) is a physical and no chemical residues processing. This study was to investigate the effect of HVEF on the tissue and oxidative deterioration during the ripening and senescence of Malus domestica after harvest. In this study we use the electric field strength as 600 kV/m and pretreatment with different time (Control, 30, 60, 90, 120 min) then storage 30 days. The result show that the HVEF can postpone the weight loss rate approach 1.0 to 3.0 times, it was display HVEF has the ability of delaying the tissue deterioration and the effect was increase with the pretreatment time. Furthermore, this phenomenon can also be verified in physical properties experimental. The HVEF can postpone the hardness decrease rate approach 1.3 to 2.0 times, these results indicate that HVEF may have the ability to inhibit the activity of tissue enzymes. Moreover, HVEF has the ability to suppress the malondialdehyde (MDA) produce rate about 1.0 to 3.0 times, and increase pre-treatment time was beneficial for inhibition efficiency. The HVEF can delay the respiration rate into 1.0 to 2.3 times, these results indicate that HVEF may have the ability to inhibit the metabolism. HVEF can delay the oxidative and organizational deterioration by inhibiting respiration rate. HVEF is an easy operating technology and suitable for the batch operations. Above all, HVEF does have limitless possibilities be applied in fresh fruits and vegetables industry.

Keywords: high voltage electrostatic fields, Malus domestica., malondialdehyde, oxidative, organizational...

REFERENCES


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