Title	Comparison of the effectiveness of some alpha, omega- dicarboxylic acids on browning inhibition in apple and banana: A machine vision study
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Abstract

Oxidative browning reactions, proceeding in many foods of plant origin, generally cause deterioration in quality by changing nutritional and organoleptic properties. Due to enormous economic impact to the fruit and vegetable industry, control of undesirable browning in plant products has received much attention from researchers and the industry. Since oxalic acid is a selective inhibitor of tyrosinase and effectively diminishes browning discoloration of minimally processed apples and bananas, it was decided to compare the relative anti-browning potency of oxalic acid to other structurally related acids including malonic, glutaric and succinic acids using a machine vision system. Bananas and apples were treated with dicarboxylic acid solutions at concentrations of 100 and 10 mM, respectively. Video images of the samples were captured to obtain color information during storage at room temperature for 5 h. Average CIE L* values of the pixels representing the total surface are of each of the slices (4 replicates) were analyzed to assess the extent of browning. Temporal changes in color spectra of controls and treatments were compared using color analysis software. Color was represented in a 512-block RGB system. The best color preservation on both apple and banana slices was obtained with oxalic acid treatments. Malonic, glutaric and succinic acids enhanced browning on sliced apples. When temporal changes in color spectra were analyzed on the sliced apples treated with malonic, glutaric and succinic acid solutions, the level of the darker colors formed during 5 h storage period was relatively higher on these treatments than on the water-dipped controls. The color spectrum profile of either banana or apple samples treated with oxalic acid was comparable, regardless of storage time. Oxalic acid was a more potent anti-browning agent compared with other structurally related acids.