Title Efficacy of aqueous chlorine dioxide and fumaric acid for inactivating pre-existing microorganisms and *Escherichia coli* O157:H7, *Salmonella typhimurium*, and *Listeria monocytogenes* on broccoli sprouts

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Abstract

The combined effect of aqueous chlorine dioxide (ClO_2) and fumaric acid as a chemical treatment to inactivate pre-existing microorganisms was evaluated using broccoli sprouts. Broccoli sprouts were treated with distilled water, 50 ppm ClO_2, 0.5% fumaric acid, and a combination of 0.5% fumaric acid and 50 ppm ClO_2. Treatment with 50 ppm ClO_2 and 0.5% fumaric acid reduced the initial populations of total aerobic bacteria, yeasts and molds, and coliforms in broccoli sprouts by 2.70, 2.46, and 1.71 log CFU/g, respectively. In addition, the combined treatment of 50 ppm ClO_2 and 0.5% fumaric acid reduced the initial populations of *Escherichia coli* O157:H7, *Salmonella typhimurium*, and *Listeria monocytogenes* inoculated on broccoli sprouts by 2.39, 2.74, and 2.65 log CFU/g, respectively, compared to the control. These results suggest that the combination of aqueous ClO_2 and fumaric acid can be useful as a hurdle for extending the shelf life of broccoli sprouts during storage.