Simultaneous UV-C and ultrasonic energy treatment for disinfection of tomatoes and its antioxidant properties

ABSTRACT

The simultaneous use of UV-C radiation at 640 or 900 μWcm-2 and ultrasonic energy of 13.78 W/L at 40 kHz was applied on tomatoes to study its ability to disinfect tomatoes from microbes. Total aerobic bacteria and yeast and mold population decreased with increase of UV-C dosage application from 0.72-10.76 kJ/m2 at constant ultrasonic energy supply. At simultaneous treatment dosage of 6.46 kJ/m2, total aerobic bacteria were significantly ($p<0.001$) reduced by 2 log reductions. Yeast and mold survivors were undetected at higher dosage treatment from 4.31 to 10.76 kJ/m2. Lower dosage treatment from 0.72 to 2.15 kJ/m2 presented minor log reductions of 0.14 to 0.75. The treatment also stimulated 41.26-50.37% increase of total phenols from an initial value of 13.38 mg GAE 100g-1 FW. Antioxidant activity increase from 27.51-36.07% was obtained at dosage level of 8.61 kJ/m2.