Effect of ozonated water combined with sodium bicarbonate on microbial load and shelf life of cold stored clementine (*Citrus clementina* Hort. ex Tan.)

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Abstract

The effect of 3 mg L^{-1} ozonated water (O_3) in combination with 3% sodium bicarbonate (SBC), on the microbial control and the postharvest quality of cold stored Clementine fruit (*C. clementina* Hort. ex Tan.), compared to the single treatments and the water wash, was evaluated. After treatments fruits were stored for 30 days at 5 ± 1 °C and relative humidity (RH) 90% followed by seven days at 20 ± 2 °C and RH 75%, to simulate retail conditions (shelf life). Microbial reduction, decay incidence, physiological disorders, weight loss, rheological properties (deformation and firmness) physical-chemical parameters (colour, total soluble solids, titratable acidity, ascorbic acid) and sensory quality were evaluated soon after treatments during fruit cold storage (T10, T20, T30) and after 7 days of shelf-life (T30 + 7).

The results showed that integrated treatments (O_3+SBC) greatly reduced the total viable count (more than 1 log unit), during the first 10 days of storage (T10), if compared to the other treatments. Moreover, O_3+SBC reduced significantly the decay incidence during the whole storage (2.6% at T30; 10.9% at T30 + 7) with respect to the control (27.3% at T30; 45.5% at T30 + 7). In particular, the control of sour rots (*Galactomyces citri-aurantii* E.E. Butler) in treated fruits was observed. Our findings did not highlight noticeable changes among treatments concerning fruits weight loss, physiological disorders, chemical composition and sensory analysis.