

APPLICATION OF OZONE AS A POSTHARVEST TREATMENT FOR CONTROLLING BACTERIAL SOFT ROT IN CARROTS (*Daucus carota*)

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Soft rot in carrot caused by *Erwinia carotovora* is one of the most serious postharvest diseases in Sri Lanka. It causes severe loss, especially during storage and transit. In this study, effects of ozonated water with different concentrations (5, 10, 15, 20, and 25 mg/L) were evaluated on the growth of *Erwinia carotovora in-vitro* and *in-vivo*. Preliminary studies were conducted to determine the best temperature and pH required for the growth of bacteria. The most effective ozonated water concentration was selected based on the reduction of bacterial total plate count. The effectiveness of the selected concentration was investigated on inoculated and naturally infected 3 replicate at 30°C and 4°C. Untreated and uninoculated tubers were considered as controls. Consumer acceptability, changes of the weight, total soluble solids (TSS), firmness, titratable acidity (TA), pH and colour of the carrots were evaluated using standard methods during the storage up to 7 days at 30 °C ± 2 and 65 ± 5% RH. It was observed that the ozonated water at the concentration of 200 mg/L was significantly reduced the total plate count, therefore, it was used in the *in-vivo* experiments. Reduction in bacterial soft rot was observed in the concentration of 200ppm compared to the control and other ozone levels. Further, the curative effect of ozone on bacterial soft rot was prominent at 30°C ± 2 and 65 ± 5% RH. Moreover, the TSS, TA and firmness, pH, colour of the carrots treated with 200mg ozone/L were 15 ± 0.24 °Brix, 0.56 ± 0.01% and 132.74 ± 0.32N, 13.74 ± 2%, 13.74 ± 4.58% and 45.65 ± 15.21 while, in the control 10.8 ± 0.03°Brix, 0.36 ± 0.01%, 142.73 ± 0.89N, 17.22 ± 5.74, 47.88 ± 15.96, respectively. This study reveals that the ozone can be applied as a postharvest treatment to reduce the bacterial soft rot incidences of carrots.

Key words: Carrot, *Erwinia carotovora*, Ozonated water, Soft rot