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Influence of the combined application of lemon essential oil and UV-C radiation on the sensory quality of minimally processed rocket

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INTRODUCTION & AIM

The consumption of minimally processed vegetables has grown rapidly due to increased consumption of healthy, additive-free products and the time savings involved in their preparation. However, the processing operations necessary for their preparation limit their shelf life. Rocket is a vegetable consumed as a salad and its main post-harvest problem is the yellowing and dehydration of its leaves. The combined application of essential oils (EO) with other treatments such as UV-C radiation can be an alternative to reduce the effective concentration of EO and the dose of UV-C radiation, and prolong the shelf life of this fresh cut vegetable.

The effect of the individual application of different concentrations of lemon EO, UV-C radiation and the combination of both treatments on the sensory quality of rocket was studied.

METHOD

-Defect-free rocket leaves (*Eruca sativa* Mill.) were washed with potable water, drained, cut into 20 mm strips, and washed again with water at 5 °C. The remaining water was removed using a hand centrifuge.

-The cut leaves were subjected to individual application of different concentrations of lemon essential oil (4 and 8 µL/mL), doses of UV-C radiation (10 kJ/m^2), and a combination of both treatments.

-A disinfection treatment with NaClO (150 ppm -2 min) and a control (no treatment, washed only with water) were included.

-All samples were packaged in PVC trays and sealed with 35 µm thick polypropylene (PP).

-All samples were stored at 5 °C for 7 days.

DETERMINATIONS

Sensory attributes (general appearance, color, aroma, uncharacteristic odors, taste and dehydration) were evaluated periodically with trained judges and color determination by L*, a* and b* parameters.

RESULTS & DISCUSSION

-All treatments maintained sensory quality for up to 7 days. However, the control and NaClO treatments had scores close to the acceptability limit of 5 at 7 days.

-The individual treatments with EO, UV-C and the combination of EO + UV-C allowed for better preservation of the sensory quality of rocket during storage.

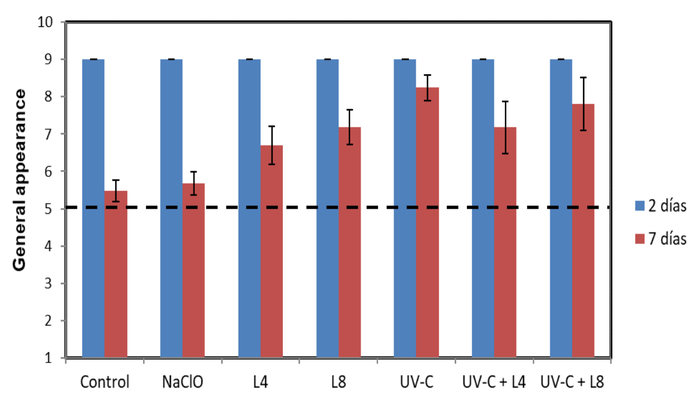
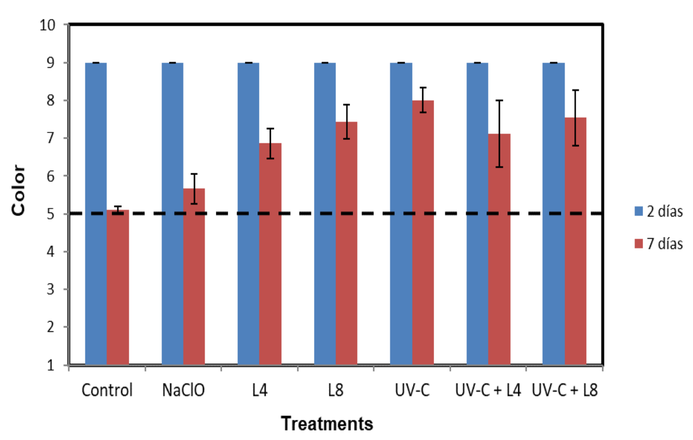


Fig. 1: Evolution of overall appearance in untreated samples and samples treated with different concentrations of lemon EO (4 and 8 µL/mL), UV-C dose (10 kJ/m^2), and the combination of both treatments on cut rocket stored for 7 days at 5 °C.

Fig. 2: Evolution of color in untreated samples and samples treated with different concentrations of lemon EO (4 and 8 µL/mL), UV-C dose (10 kJ/m^2), and the combination of both treatments on cut rocket stored for 7 days at 5 °C.



-No significant changes were observed in color parameters. The combined EO (8 µL/mL) + UV-C treatment showed the highest L* values (Fig. 3).

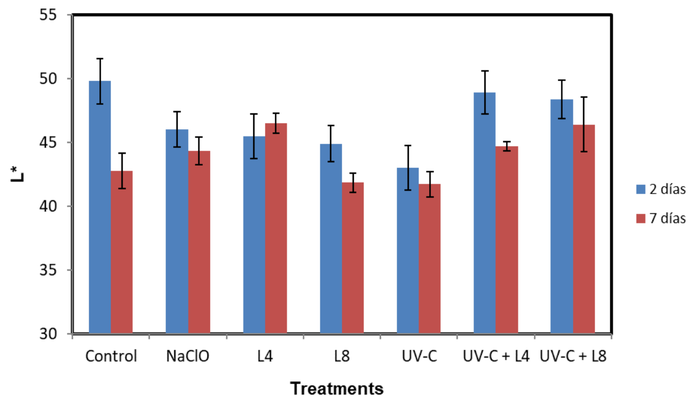


Fig. 3: Evolution of parameter L* in untreated samples and samples treated with different concentrations of lemon EO (4 and 8 µL/mL), UV-C dose (10 kJ/m^2), and the combination of both treatments on cut rocket stored for 7 days at 5 °C.

CONCLUSION

These results are promising for continuing studies with these technologies in the conservation of this vegetable.

FUTURE WORK / REFERENCES

Appropriate technologies to extend the shelf life of rocket leaves processed as a minimally processed vegetable.