Effect of non-thermal processing on the aromatic profile of Cantaloupe melon juice

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Introduction

Consumers demand for fresh-like and nutritious food products have launched research to alternative and milder non-thermal processes, which have gained particular importance in fruit juice segments. Aroma plays a dominant role in flavor and can be considered a key indicator for evaluating juices quality. Ultraviolet-C (UV-C) radiation and ozone-based treatments are alternatives to the conventional thermal pasteurization, avoiding the negative impact of high temperatures on flavor characteristics.

Objective

The objective was to apply those treatments to melon (*Cucumis melo* var. *reticulatus*) juice and assess 34 key aroma volatiles (**acetate** and **non-acetate** esters, **aldehydes**, **alcohols**, and sulfur compounds).

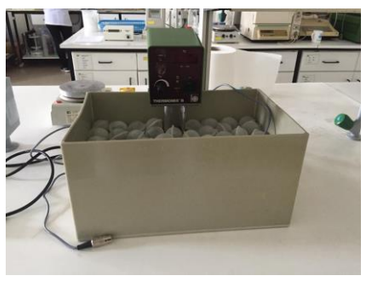
Methods

Sample

centrifuge

Treatments

- Pasteurization (72 °C / 15 s)



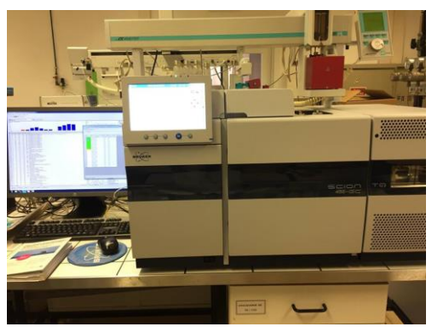
- UV-C radiation (5 & 20 min)

Intensity = 13.44 W/m^2

- Ozone (10, 30 & 60 min)

[O_3] = 7.0 ± 2.4 g/L

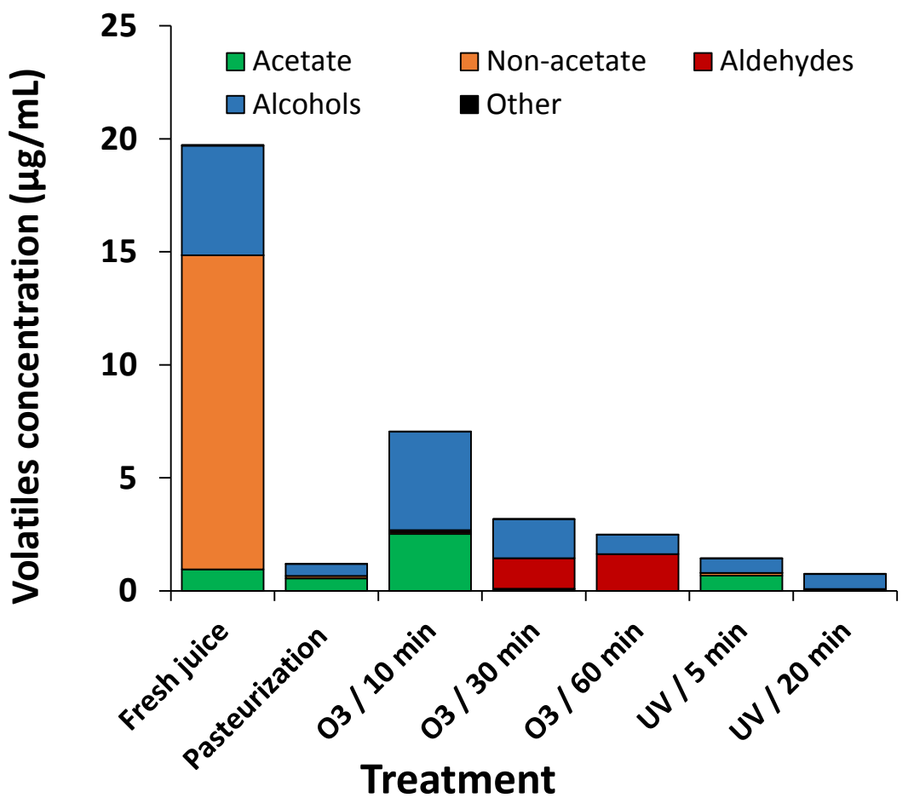
Volatiles identification & quantification



gas chromatography–mass spectroscopy (GC-MC)

Results

Most important fractions of aroma volatiles



- Fresh juice had mainly non-acetate volatiles (70%), alcohols (25%) and acetates (5%). Other volatiles were detected as residual traces.
- **Non-acetate** volatiles were dramatically reduced after all treatments applied.
- **Alcohols** were detected in considerable amounts after all treatments exposure.
- **Aldehyde** volatiles increased significantly with O_3 / 30 min and O_3 / 60 min.
- **Acetates** increased 3 times with O_3 / 10 min. However, as the treatment time increased, these volatiles were detected as residual traces.

Conclusion

All treatments had a significant impact on the aromatic profile of Cantaloupe melon juice.
Non-acetate compounds such as ethyl butanoate and ethyl 2-methyl butanoate that are important aroma contributors even in low amounts were reduced to non-detectible threshold, after all treatments applied.

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