THE INFLUENCE OF THE EXTRACTION PROCESS ON OLEOCANTHAL CONTENT OF EXTRA VIRGIN OLIVE OIL

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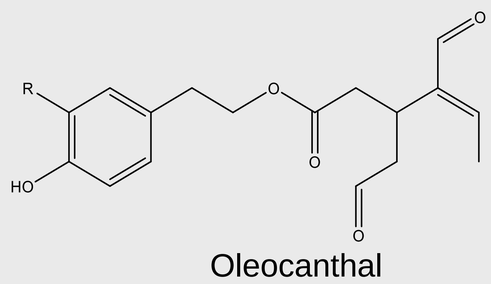
BACKGROUND

During mechanical extraction of extra virgin olive oil (EVOO), hydrolysis reactions take place due to the activity of endogenous *β*-glucosidases, mainly during the crushing and the malaxation steps.



Oleocanthal

- Anti-breast cancer properties[1]
- Reduction of risk to suffer cardiovascular diseases[2]
- Protective effect against Alzheimer disease[3]
- Therapeutic agent for Inflammatory diseases[4,5]

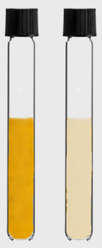
METHODOLOGY

- *Corbella* cultivar.
- Ripeness (0-1)
- Irrigation.

Abencor Method (Enginering and systems, Sevilla).

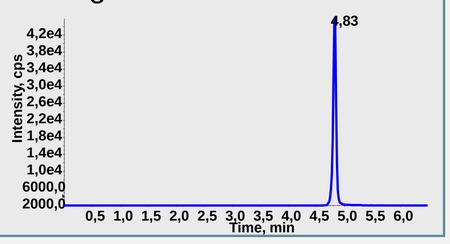
Malaxation temperature °C	*Malaxation time (min)*	*Crushing size (mm)*	*Treatment*
27	30	4	T1
		6	T1
	60	4	T1
		6	T1
32	30	4	T1
		6	T1
	60	4	T1
		6	T1
37	30	4	T1
		6	T1
	60	4	T1
		6	T1

- Liquid-Liquid Extraction (Methanol:Hexane).



- Reconstitution phase H_2O:MeOH (80:20)
- Oleocanthal (m/z 303/165).
- UPLC-MS
- MeOH 0.1% formic acid and H_2O 0.1% formic acid.
- Negative ionization.
- Multiple reaction monitoring.

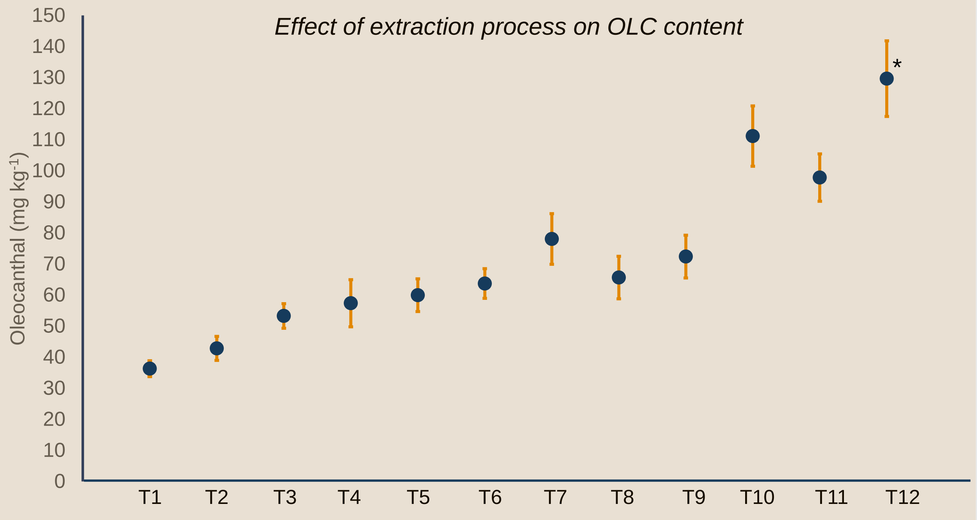
- Analyst software.
- SAS 9.0 (*p 0.05)*

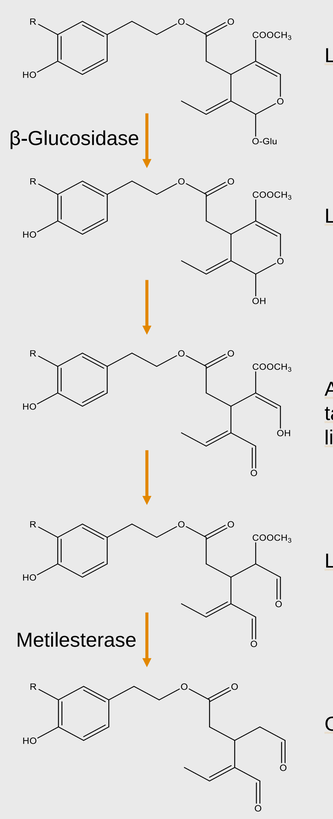


AIM

The aim of the work was to determine the effect of the crushing size, temperature and time of malaxation on oleocanthal (OLC) content in EVOO.

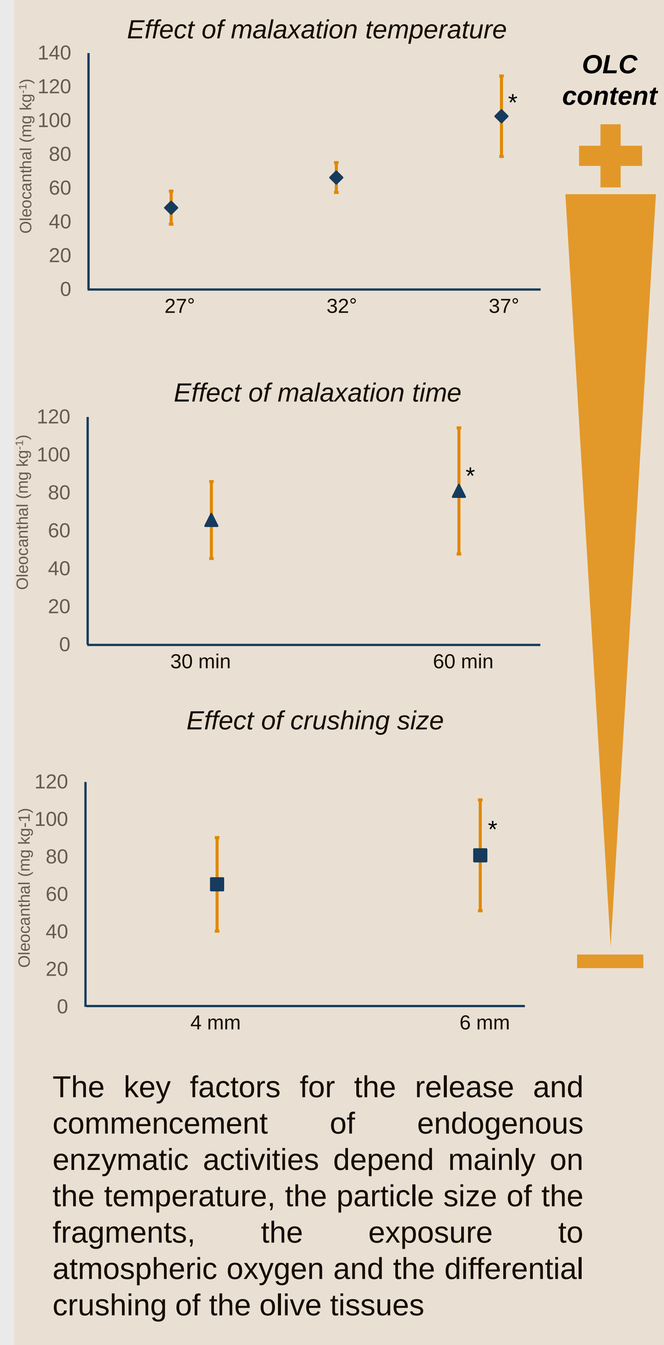
RESULTS





Endogenous enzymes such as *β*-glycosidase (which hydrolyzes phenolic glycosides) and oxidoreductases, like PPO and POD (which oxidase phenolic compounds), may be the main biochemical factors affecting the phenolic content of EVOO.

Figure 1. Possible transformation pathways of oleocanthal in olive oil extraction.



The key factors for the release and commencement of endogenous enzymatic activities depend mainly on the temperature, the particle size of the fragments, the exposure to atmospheric oxygen and the differential crushing of the olive tissues

* Significant differences ($p < 0.05$)

CONCLUSIONS

- The highest amounts of OLC were found in the EVOO produced by malaxation during 60 min at 37 ºC and 6 mm of crushing size (129.7 ± 12.2 mg/kg).
- On the contrary, the lowest recovery was found at 27 ºC during 30 min and 4 mm of crushing size, decreasing to 72 %.
- The temperature was the most important factor affecting OLC content. A positive relationship between OLC content and malaxation temperature was obtained, possibly due to the release of phenolic compounds from the cell wall.

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