

INFLUENCE OF HYDROLYTIC ENZYMES ON ANTIOXIDANT EFFICIENCY OF OLIVE LEAF EXTRACTS

INTRODUCTION:

- Olive leaves are a natural and low-price source of phenolic compounds, such as oleuropein and hydroxytyrosol
- These compounds have high antioxidant activity and anti-inflammatory, antimicrobial and cardioprotective effects
- Olive leaves represent a big part of olive production biowaste (yearly 400 tons in Slovenia and 4.5 million tons in the EU)

MATERIALS:

- OLIVE LEAVES; sorts Cipressino (ITA August 2021) and Istrska belica (SLO April 2014 and November 2020)
- Commercially available digestive enzymes mix
- Water as a green solvent

METHODS:

- Extraction with and without enzymes:
 - ◇ Extraction at pH 2, 4, 6, 8 and with unadjusted pH
 - ◇ Different extraction methods:
 1. Stirring
 2. Shaking
 3. Continuous simulation of the digestive system

RESULTS:

- Phenolic content: higher in samples without added enzymes
- Extraction yield: higher in samples with added enzymes, especially digestion simulation samples
- Antioxidant activity: the most efficient was the simulation of digestion, the samples without added enzymes have higher activity (except at pH = 4)
- HPLC analysis results: the content of oleuropein is higher in samples without added enzymes, while the content of hydroxytyrosol is higher in samples with added enzymes (except at pH = 8) - content of other polyphenols to be researched

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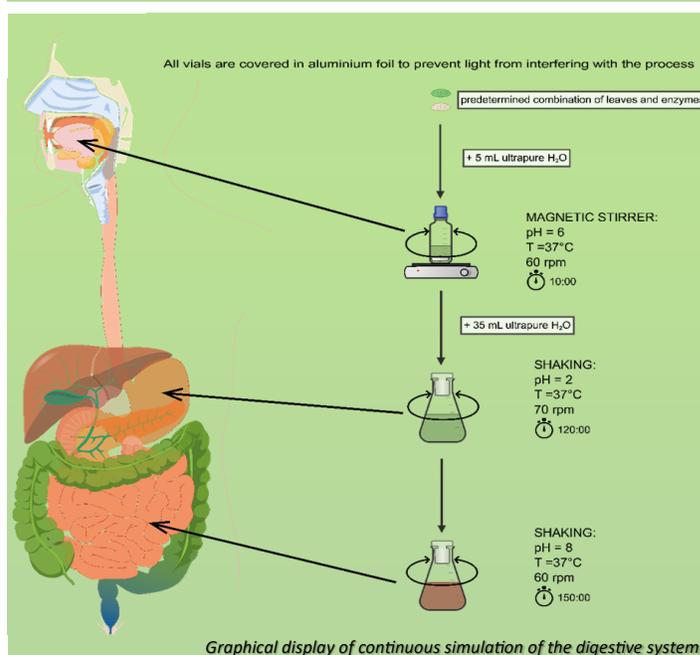
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GOALS:

- Research the extraction of beneficial compounds from olive leaves using hydrolytic enzymes and green solvents
- Compare the antioxidant activity of different sorts and ages at different conditions
- The use of chemically unprocessed olive leaves biowaste as a food supplement



CONCLUSIONS:

- With enzymes antioxidant activity and content of phenolics is a bit lower, but still very high.
- Higher extraction yield with added enzymes.
- Water is a great solvent for extracting polyphenols.
- Leaf age does not lower phenolic content nor antioxidant activity.

Economic plan (potential application):

- The use of olive leaves offers an economic opportunity, especially in the field of nutritional supplements
- approaching the principles of zero-waste and zero carbon footprint with the use of olive pruning byproduct and almost no transportation emissions
- No need for chemical processing—ground leaves are sold in shapes of capsules, tablets, or powder
- It would be the only Slovenian olive leaf supplement on the market