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RESEARCH ON ENCAPSULATION AND MICROENCAPSULATION OF STRAWBERRY EXTRACTS. ET2FRESACAPS

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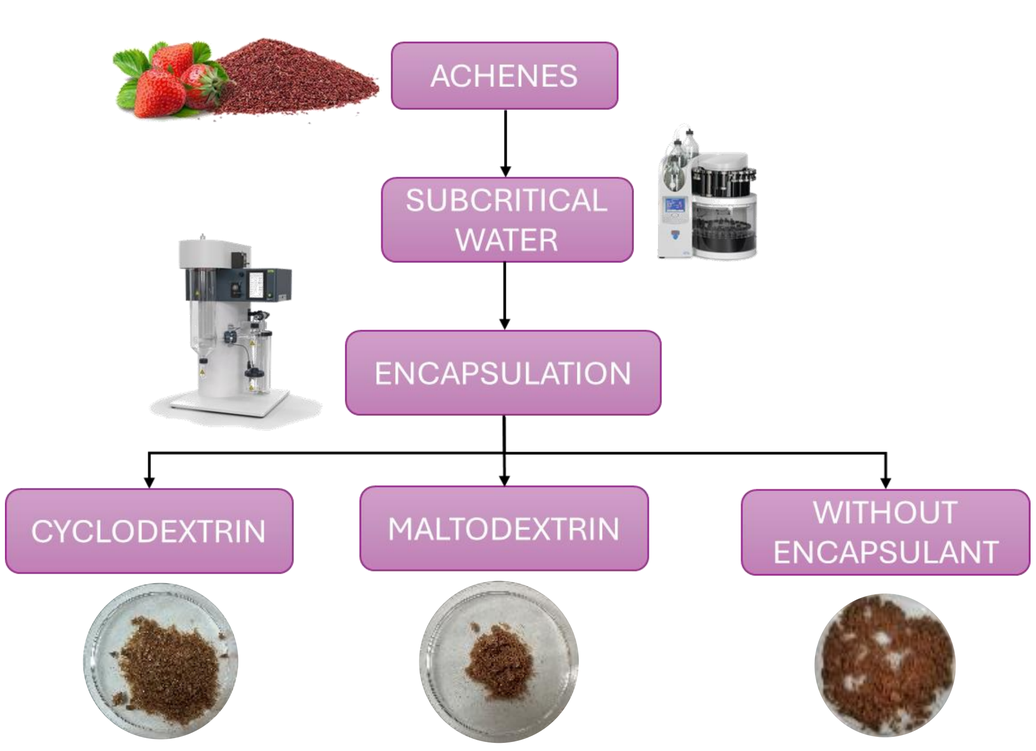
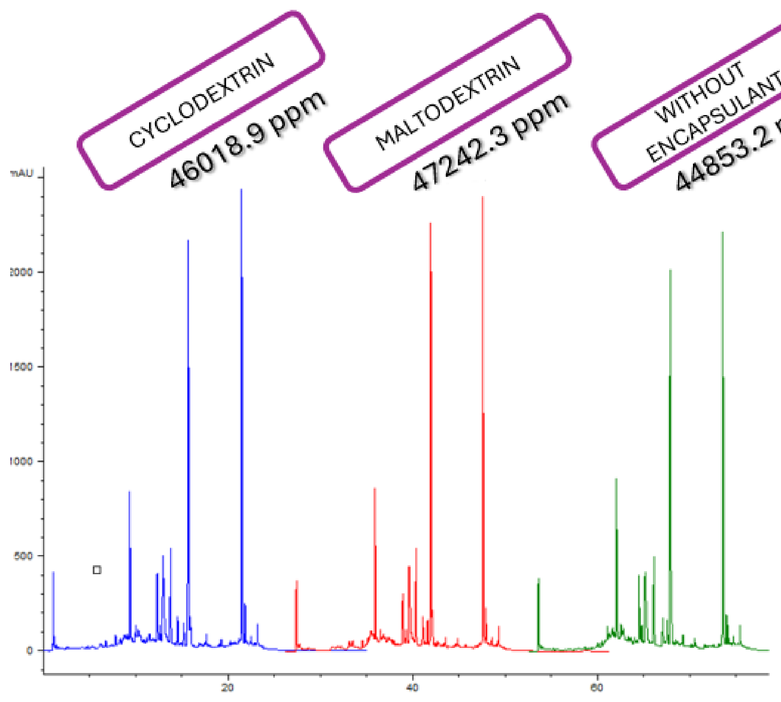
INTRODUCTION AND OBJECTIVES

Strawberries are functional foods, which include edible fiber, vitamins, minerals and polyphenols, and are characterized as a source of antioxidants. Most strawberry production is sold as fresh fruit, but there is an alternative for fruit that cannot be sold fresh, so 21% of strawberry crops are used for the industrial processing of derived products, generating streams of by-products rich in strawberry bioactive compounds that are treated as organic waste. The ET2FRESACAPS project will extract, preserve and stabilize by encapsulation the bioactive compounds of strawberry by-products through the use of different sustainable and economically viable technologies, giving added value to the by-products of the strawberry sector for their application in different food and cosmetic sectors, as natural dehydrated ingredients.

METHODOLOGY

Achenes, by-products generated during the processing of unmarketable strawberries, represent a rich source of bioactive compounds. Among the extraction technologies evaluated, subcritical water has proven to be the most promising compared to treatments such as microwave and supercritical CO_2. Extraction with subcritical water was optimized, achieving the maximum concentration of compounds of interest under the conditions of 150 bar pressure, 120 °C temperature and an extraction time of 10 minutes. To stabilize and preserve the extracted bioactive compounds, the encapsulation of the optimal extract was evaluated using two encapsulating agents: maltodextrin and cyclodextrin, both used at a concentration of 5%. The extract was also evaluated without the application of encapsulant and the final concentrations of bioactive compounds in the different samples were compared. The results allow establishing efficient parameters for the preservation of bioactive compounds of interest, highlighting the potential of subcritical water technology for the extraction of bioactive compounds of interest and encapsulation strategies for their preservation.





RESULTS AND CONCLUSIONS

- ✓ Subcritical water technology is the most promising technology for obtaining compounds of interest compared to microwave and supercritical CO2 technologies.
- ✓ The process parameters for the extraction of compounds of interest with subcritical water have been optimized, with 120 °C being the temperature at which the most is extracted from the achenes.
- ✓ Comparison of dehydration with and without encapsulants has been carried out, where it has been observed that the use of encapsulants such as cyclodextrin and maltodextrin protect some compounds of interest from degradation, for example, ellagitannins, which are observed in lower concentrations in the product without encapsulation due to exposure to degradation of the same.

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