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TITLE: Improving Selective Extraction of Bioactive Compounds through Ionic liquids and Deep Eutetic Solvents Design

BACKGROUND

Natural products production is currently a hot research topic due to the market demand. Food wastes are recognized as under exploited residues from which a variety of valuable chemicals can be extracted.

The use of green chemical technologies in the development of sustainable waste valorization practices is mandatory. Ionic Liquids have been used as green solvents and promoters of sustainable separations technologies. In particular, deep eutetic solvents are the new green solvents that can be prepared in a simple way (mixing and heating) from naturally existent compounds.

OBJECTIVES

- To develop green chemical technologies for sustainable waste valorization
- To prepare deep eutectic solvents using natural compounds from renewable resources
- To test several different functionalities in non toxic, biodegradable ionic liquids and deep eutectic solvents in the extraction bioactive compounds from cherries (*prunus avium*) culls
- To select highly selective solvents for the most important families of biocompounds
- To integrate with pressurized CO₂ frctionation procedures and perform back extraction techniques in order to isolate sets or families of compounds

PROJECT DESCRIPTION

In this project we aim at exploring the use of Ionic Liquids and Deep Eutectic Solvents, as solvents or co-solvents, to extract natural bioactive compounds from cherries (*prunus avium*) culls. Special attention will be paid to the use of development of new environmentally benign (non toxic and non persistent) solvents based on materials from renewable resources, such as vitamins, sugars, organic acids etc., which properties can be advantageously tailored according to the families of bioactive compounds under study.
The proposed project comprises the following tasks

- Task1. To perform a literature search on the proposed topic
- Task 2. To prepare deep eutectic solvents using natural compounds from renewable resources
- Task 3. To test several different functionalities in non toxic, biodegradable ionic liquids and deep eutectic solvents in the extraction bioactive compounds from cherries (*prunus avium*) culls
- Task 4. To optimize experimental conditions for the most promising ILs and DES selected in the previous task
- Task 5. To apply high-pressure fractionation methodologies and perform back extraction techniques in order to isolate sets or families of compounds

TIMELINE (use fill tool for the cells)

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10
Task 1	█									
Task 2	█	█	█							
Task 3			█	█	█	█	█	█	█	
Task 4								█	█	█
Thesis								█	█	█