

4.24.51. P.24.128 | Utilizing Functional Compounds Extracted from Black Currant Pomace for the Production of High-Value Food Products

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Background: The increasing demand for nutritious diets has boosted the popularity of plant-based foods. Black currants, known for their rich array of phytochemicals like fiber, vitamins, phenolic compounds, and amino acids, are a prime choice. However, their short shelf life often leads to the generation of pomace, traditionally discarded. This study aims to extract and utilize these compounds from black currant pomace to create healthy food products and foster sustainable resource use.

Methods: The raw material was mechanically separated into two distinct fractions, namely the skins/residual pulp and seeds. Proximate nutritional composition was determined by standard methods for each fraction, meanwhile, fermentable sugars, total phenolic compound and anthocyanins were determined by WineLab methodology. ScCO₂E was carried out at 60 °C and 45 MPa during 120 min. Triacylglycerols were determined using the UPLC-Q/TOF. Concentrations of tocopherols and sterols were determined with the same Waters Acquity UPLC system.

Results: Analysis revealed the highest lipid yield within the seed fraction, reaching 15.66% and 18.29% using scCO₂E and Soxhlet-hexane extraction methods, respectively. The major predominant triacylglycerols in the seed extract were identified as unsaturated LLLn and OLnL. Additionally, the extract was found to be a rich source of tocopherols and sterol. This fraction also has a relatively high amount of protein content of 16.77% and a dietary fiber content of 51.84%. In contrast, the peel exhibits a high carbohydrate content of 77.80%, primarily composed of dietary fiber (43.46%) and fermentable sugars 19.68 g/100 g. The red colour of the peel extracts is due to the presence of anthocyanins, and a concentration of 25.65 mg GAE/g was detected in the total phenolic compounds.

Conclusions: The findings collectively demonstrate the high potential of blackcurrant pomace as a valuable source of bioactive compounds for incorporation into sustainable superfood blends or functional food products.

4.24.52. P.24.129 | Extraction of Lipophilic Bioactive Compounds from Alaria Esculenta Using Novel Extraction Techniques and Solvents

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Background: Alaria esculenta is edible brown seaweed which is commercially cultivated in the northern Europe. It contains many valuable bioactive compounds, pigments and nutrients such as omega-3 fatty acids, carotenoids, polyphenols, proteins, minerals, chlorophyll etc. In the recent decade a lot of focus was given to development of green extraction techniques. Pressurized-liquid extraction (PLE) and natural deep eutectic solvents (NADES) are some of these novel extraction technologies which could be used for extraction of lipophilic bioactive compounds.

Methods: Novel extraction techniques including pressurized liquid extraction with ethanol (90% v/v) and acetone (90% v/v), and NADES solvent C10:Menthol (1:2) were employed to recover lipophilic extracts from brown seaweed. Soxhlet extraction served as the control. All obtained extracts underwent analysis for chlorophyll content, carotenoids content, fatty acid profile, and DPPH antioxidant activity.

Results: Novel and environmentally friendly extraction techniques offer several advantages over the conventional Soxhlet technique, particularly in terms of the quantity of extracted bioactive compounds. All obtained extracts exhibited antioxidant activity tested by DPPH. Eicosapentaenoic acid and alpha-linolenic acid essential fatty acid were

detected in the extracts. Significant amount of fucoxanthin and chlorophyll was also detected in lipid extracts.

Conclusions: *A. esculenta* presents a promising source for obtaining lipophilic extracts containing essential omega-3 fatty acids, antioxidants (e.g., carotenoids), and natural pigments (e.g., chlorophyll). The recovered extracts hold potential for application in the food and nutraceutical industry due to the presence of bioactive compounds beneficial to human health.

Acknowledgment: The work on this paper is supported by project that has received funding from the European Union's Horizon Europe programme under grant agreement No. 101084437.

4.24.53. P.24.130 | Salty Solutions: Advancing Insect Protein Emulsification for Sustainable Food and Beyond

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Background: The growing demand for protein prompts exploration of alternative sources like insects, known for their sustainability. This study extensively examines insect protein's emulsifying properties, especially using salt-assisted extraction methods. The findings hint at potential food industry advancements and emphasize the intricate relationship between insect protein traits, extraction methods, and their function in O/W emulsion systems.

Methods: Proteins were extracted from various insects, including yellow mealworm, cricket, and locust, using four different salt-assisted techniques, preceded by process optimization using Response Surface Methodology. The study characterized selected physicochemical properties (protein purity, solubility, FT-IR spectrum, oil- and water-holding capacity) and identified the mechanisms of emulsion instability through TurbiscanLabExpert, protein zeta-potential, and rheological characterization of isolates.

Results: The study found that isolates from salt-assisted extraction had significantly higher purity (65–75%) and solubility (75–95%) compared to the control. Combining salting-in/out methods yielded protein isolates with superior oil (3.5 g vs. 2.8 g) and water (3.3 g vs. 2.5 g) retention. Additionally, all salt-assisted extraction methods showed a high zeta potential (<-18 mV), indicating potential surface interactions for emulsion stability.

Conclusions: The study shows that insect protein isolates from salt-assisted extraction have higher purity and solubility than controls. Combining salting-in/out methods improves oil and water retention. Also, all salt-assisted extraction methods exhibit high zeta potential, indicating enhanced emulsion stability. These findings underscore salt-assisted extraction's effectiveness in improving insect protein properties, suggesting their valuable potential for diverse food industry applications.

4.24.54. P.24.131 | Evaluation of Different Extraction Methods on Tea Waste Obtained from Three Brewing Techniques

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Background: Tea is highly popular due to its numerous health promoting, anti-inflammatory, anticancer, and antioxidant properties. The global consumption of tea reached 6.7 billion kilograms in 2022 and is expected to increase to 7.4 billion kilograms by 2025. As tea consumption rises, so does the production of tea waste. This study aims to compare different extraction techniques for obtaining bioactive compounds from tea waste processed by three brewing methods.

Methods: Tea waste obtained by the different brewing techniques (French press, Pure and Gaiwan brew) is collected and then the main bioactive compounds are extracted according to different extraction methods: solvent, supercritical CO₂, microwave and