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ABSTRACT BOOK

algae, grown widely in the Mediterranean Sea. This study aimed to perform ultrasound-assisted enzymatic protein extraction from C. spongiosum under optimum conditions and to evaluate the techno-functional properties and bioactivity of the extracts.

Methods: The optimum extraction conditions were determined by response surface methodology. The obtained extract (CS-PE) was characterized by investigating solubility, water and oil holding capacity, foaming and emulsion activity and stability. Moreover, the CS-PE was subjected to in vitro simulated digestion. The phenolic profile, total phenolic content (TPC), antioxidant activity (AOA), and angiotensin converting enzyme (ACE) inhibition were determined by spectrophotometric methods and high-pressure liquid chromatography.

Results: The optimum extraction conditions were ultrasonic application time: 2.64 min; substrate/enzyme: 2.0; and extraction time: 170.44 min. The water and oil holding capacities were 0.12 g/g and 0.83 g/g, respectively. Emulsion activity and stability were 11.25% and 57.50%, respectively. The foaming capacity of the CS-PE was 6.27% with zero stability. The catechin appeared in the gastric digestion (26.03 mg/kg) of CS-PE and the concentration was approximately tripled in the intestinal phase (77.37 mg/kg). Accordingly, after digestion, the TPC, AOA(CUPRAC), and AOA(ABTS) of the CS-PE were increased by 293.92%, 107.85%, and 333.05%. In addition, the protein extract of C. spongiosum had 8.9% ACE inhibitory activity while the digested sample had no ACE inhibition activity.

Conclusions: The study identified the optimum conditions for ultrasound-assisted enzymatic extraction. It explored the techno-functional and bioactive properties of CS-PE, which can be utilized as an alternative protein source.

3.39.2. Drosophila Melanogaster as an In Vivo Model to Study the Effects of a Dietary Supplementation with Acorn N Healthy Longevity

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Background: Acorn, the fruit of Quercus spp. has recently been object of interest as sustainable and forgotten resource to be rediscovered to design new food for human consumption due to its interesting nutritional profile (high in fiber and bioactive compounds). The aim of this study was to assess the potential use of acorn flour in a porridge application, to evaluate its physico-chemical attributes, and verify its dietary effect on longevity in the in vivo model of Drosophila melanogaster.

Methods: Acorn flour (AF, Dary Natury Sp. z o. o., Poland) and acorn porridge (P, AF:water 1.0:3.5 ratio; cooking under stirring at 95 °C for 20 min) were characterized for their physico-chemical properties (pasting ability, composition of bioactive compounds by HPLC-ESI-MS/MS and antioxidant properties). Freeze dried P was included or not (CTRL diet) in the diet of Drosophila melanogaster (DM, Canton-S wild-type strain; Formula 4–24 ®, USA) at 10% level (POR diets, to mimic breakfast dietary load), and flies (male and female) longevity was assessed for >1200 individuals and shown as Kaplan–Meier survival curves.

Results: AF and P were characterized by a large variety of bioactive compounds (phenolic acids, flavonoids, and hydrolysable tannins). Ellagic and gallic acids were the most represented (1015.9 and 753.9 mg/kg, respectively). AF pasting properties were coherent with those of the same food category. 10% P supplementation in DM diet was found to significantly extend flies lifespan of both female and male flies ($p < 0.0001$).

Conclusions: The aim of this study was to evaluate an acorn porridge food application focusing physico-chemical attributes and verification of dietary effect on longevity in the in vivo model of Drosophila melanogaster.

Acorn porridge was proven to be a very interesting food as it is characterized by a high content of bioactive compounds. It was found to have a positive effect on DM lifespan, possibly linked to its nutrient and non-nutrient composition able to promote healthy ageing.

3.39.3. Assessing the Impact of High-Fiber Confectionery Supplementation on Gut Microbiota, Scfa Production, and Lipid Metabolism: An In Vivo Study in Wistar Rats

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Background: Gut microbiota (GM) influences obesity, it can be shaped by increasing fiber intake (FI), enhancing short-chain fatty acid (SCFA) production and liver energy metabolism. Functional confectionery provides appealing ways to increase FI and modulate the GM. High-dietary-fiber agro-industrial by-products such as mango peel and bagasse can be incorporated as ingredients in functional confectionery. A high-fiber confectionery made from mango by-products (MC) was previously formulated, characterized, and tested for digestibility and fermentability in vitro. This in vivo study evaluated MC's impact on GM, SCFA production, and intestinal and liver tissues.

Methods: An 11-week study was conducted with 4 groups (n = 6) of 5-week-old male Wistar rats. Each group received either a standard (STD) or high-fat diet (HFD), with one group per diet type supplemented with MC (SMC). After euthanasia, sample collection was done. Histological and transcriptomic analyses were performed on intestinal and hepatic tissues using Illumina NovaSeq 6000, confirmed by qPCR. Cecal and fecal samples were sequenced using the 16S rRNA gene, and SCFA quantification was done via GC-MS. This project was approved by the Bioethics Committee of the Universidad Autónoma de Querétaro (CBQ21/015), following NOM-062-ZOO-1999 and NIH guidelines for laboratory animal care and use.

Results: The HFD caused intestinal epithelial damage and liver fat infiltration, but SMC groups displayed protective effects. Transcriptomic analysis revealed gene modulation, including upregulation of three cytochrome P450 genes associated with lipid metabolism. Significant differences in the composition of GM impacted SCFA profile, promoting the isobutyrate production. Furthermore, obesogenic species (e.g., R. gnavus and R. torques) decreased with SMC, while beneficial species (e.g., F. prausnitzii) increased.

Conclusions: MC-supplementation has a modulatory role on GM and lipid metabolism when a HFD is consumed. Further studies are needed to clarify metabolic pathways.

3.39.4. Cholesterol Metabolites Act on Estrogen Receptor Alpha Expressed in Hypothalamus of the Brain to Modulate Appetite

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Background: The goal of this proposed research is to understand the central mechanisms of diet-induced obesity. While diets high in fat (HFD) are known to cause obesity, how such diets act on the brain to impair energy balance is unclear. It is well documented