BIO-SUSTENTABILIDADE E BIO-SEGURANÇA ALIMENTAR, INOVAÇÃO E QUALIDADE ALIMENTAR

23-26 de outubro de 2022

Castelo Branco

Sociedade Portuguesa de Química

Instituto Politécnico de Castelo Branco

Instituto Politécnico de Castelo Branco
Escola Superior Agrária

Câmara Municipal
Castelo Branco

EuChemS
European Chemical Society
Division of Food Chemistry

12:30 - 12:45	**OC** The dynamics of sustainability claims and certifications in new food products *Luís Rodrigues, João Ferreira, Bruno Henriques, Dalila Vieira*
12:45 - 13:00	**End Session**
13:00 - 14:15	**Lunch**
	Social Program

Wednesday – 26th of October 2022

ROOM 3	**Chairperson –** Elisabete Coelho
09:30 - 09:45	**OC** Novel type of *Camellia sinensis* green tea rich in polyphenols and L-theanine, a promotor of cognitive functions *Lisete Sousa Paiva, Elisabete Lima, Madalena Motta, José António Bettencourt Baptista*
09:45 - 10:00	**OC** Evaluation of microalgae enriched gluten-free bread as functional food *Marco António da Costa Freitas, Ferreira, J.P., Nunes M.C., Raymundo, A.*
10:00 - 10:15	**OC** Development of a Clean Label mayonnaise using fruit flour *Maria Vieira, Simões S., Castelo-Branco D., Figueira D., Tasso A., Raymundo A.*
10:15 - 10:30	**OC** Microalgae biomass as a relevant source of vitamin B12, in vegetarian and vegan diets *Albano Joel Moreira Santos, Isabel Sousa, Anabela Raymundo*
10:30 - 10:45	**OC** Crop rotation and irrigation regime affects the nutritional and chemical profile of *Cichorium spinosum* *Beatriz H. Paschoalinotto, M.A. Prieto, Compocholi M, N. Polyzos, S.A. Petropoulos, Isabel C.F.R. Ferreira, Maria Inês Dias, Lillian Barros*
10:45 - 10:52	**FC** Revalorization of *Prunus avium L.*: Determination of bioactive compounds *Erika N. Vega, Maria Inês Dias, Virginia Fernández Ruiz, Lillian Barros, Patricia Morales*
10:52 - 10:59	**FC** Study on the effect of the concentration and drying of microalgae on *Chlorella vulgaris* and *Arthrospira platensis* enriched pasta *Rafael Quinta, Helena Cardoso, Joana Silva, Patrícia Fradinho, Cristiana Nunes, Anabela Raymundo*

Ficha Técnica

Título

Livro de Resumos do XVI Encontro de Química dos Alimentos - Bio-Sustentabilidade e Bio-Segurança Alimentar, Inovação e Qualidade Alimentar

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As doutrinas expressas em cada um dos resumos são da inteira responsabilidade dos autores.

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Crop rotation and irrigation regime affects the nutritional and chemical profile of *Cichorium spinosum*.

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The sustainable management of agricultural systems offers synergistic opportunities for the co-production of agricultural and natural capital outcomes.[1] A properly sized agricultural system is essential for the sustainable and ecological maintenance of crop productivity. Irrigation management is an important adaptation strategy to improve crop resilience to global climate change while crop rotation brings benefits such as increased crop yields through high soil fertility and reduced fertilizer inputs.[2] *Cichorium spinosum* L. (spiny chicory) is a wild edible plant that has received very recent attention as a potential alternative/complementary crop. It is a plant traditionally consumed in the so-called Mediterranean diet due to its high nutritional value and various beneficial health effects.[3] The study aims to improve and integrate the cultivation of this species in farming systems of the Mediterranean region. Thus, a combination of full or deficit irrigation with or without crop rotation with maize was established in an attempt to establish the commercial cultivation of spiny chicory. Two control samples were cultivated: C0 (rain-feed with crop rotation with maize) and C00 (rain-feed without crop rotation). The nutritional profile was evaluated using AOAC methods. Energy was calculated according to the equation: energy (kcal per 100 g) = 4 x (g protein + g carbohydrate) + 2 x (g total dietary fiber) + 9 x (g fat). The profile of organic acids, minerals, fatty acids and sugars were performed using UFLC-PDA, atomic absorption spectrophotometry, GC-FID and HPLC-RI, respectively. Although the impacts that a sustainable farming system generates on the crop involved is a long-term assessment and after the system has been repeated for several growing periods, however some changes are already noticeable in the first growing period. In the nutritional profile, there were no differences between the six experimental treatments, with the exception of the total dietary fiber content which samples C0 (control) and CFIC (full irrigation with crop rotation with maize) showed the highest levels. The samples presented low values of total fat, being the sample C0 the one that presented the highest value (3.5 g/100g dry weight). Promising levels of crude protein were indicated by all samples, however once again the control sample had the highest content (C00). The CFIC and CFIN samples (full irrigation with and without crop rotation, respectively) showed the lowest values of carbohydrates. The sample CDIC (deficit irrigation with crop rotation with maize) showed the highest energy (276.3 kcal/100g dry weight) probably due to the low fiber content and consequently the high carbohydrate content. Five organic acids were identified in the spiny chicory samples, mostly quinic acid, except in the CFIN sample in which oxalic acid had the highest concentration. In terms of minerals, the samples with full irrigation showed higher concentrations of iron, manganese and copper and lower calcium, while the samples without crop rotation showed lower concentrations of potassium. The predominant fatty acids identified and quantified were linolenic, linoleic, and palmitic acids, the sum of which represented 82 to 86% in the studied samples, while the sample with deficit irrigation and without crop rotation (CDIN) presented the lowest percentage. Finally, the sugars identified in higher concentrations were sucrose, glucose, fructose, and trehalose, respectively, however, it is suggested that crop rotation with maize altered the profile of sugars by increasing their concentrations. Considering that these are preliminary results, it was possible to point out positive impacts of the tested agronomic practices on nutritional parameters of the species that could be commercially applied aiming to integrate wild edible species in sustainable and low inputs farming systems.

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