



## About

IWBC started on 2016, with a great success, attracting attendees from Brazil and other countries. In face of this, the Organizing Committee improved the Workshop into a Congress, which was firstly held on November 2018.

The topic of bioactive compounds is really transforming the modern view of Food Science and Nutrition in the World; bring attention to the food functionality related to disease prevention and health promotion. These new concepts are also calling attention from companies, with see opportunities for developing new products for emerging consumers.

The food scientists face new challenges in developing new products, which also should meet several exigencies from the consumers, like: ease to consume, practical, tasty, nutritious, among others. Furthermore, new technologies and new formulations are emerging to attend to this new demand, for consumers that look for products that could improve health and prevent diseases.

On the other hand, malnutrition is a big world challenge, including famine and bad nutrition habits. Food science and technology have a great opportunity in this scenario as well, for Universities, which promotes the training of cutting edge professionals; and for companies, which are responsible for the delivery of new products on the market.

Brazil and other countries should interact in order to find new solutions for innovation and experience exchange for the new food industry.

ICBC aims to bring new information for the knowledge frontiers for research, development and innovation.

## Support



## Graph

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Process engineering and emerging technologies (ET)

## CHARACTERIZATION OF THE BIOLOGICAL RESIDUE *BRASSICA OLERACEA* L. TO OBTAIN A POTENCIAL NATURAL INGREDIENT

PEPINELLI<sup>1,2,4</sup>, A.L.S.; OLIVEIRA<sup>1,2,3</sup>, T.C.G.; CALEJA<sup>1,2</sup>, C; DÍAS<sup>1,2</sup>, M.I..; KOSTIĆ<sup>5</sup>,  
M.; SOKOVIC<sup>5</sup>, M.; GONÇALVES<sup>4</sup>, O.H.; OLIVEIRA<sup>3</sup>, M.B.P.P.; PEREIRA<sup>1,2</sup>, E\*;  
BARROS<sup>1,2</sup>, L\*.

<sup>1</sup> Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, C. Santa Apolónia, 5300-253 Bragança, Portugal.

<sup>2</sup> Laboratório para a Sustentabilidade e Tecnologia em Regiões de Montanha, Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal.

<sup>3</sup> REQUIMTE/LAQV, Departamento de Ciências Químicas, Faculdade de Farmácia da Universidade do Porto, Rua Jorge Viterbo Ferreira 228, 4050-313 Porto, Portugal

<sup>4</sup> Universidade Tecnológica Federal do Paraná, Câmpus Campo Mourão, Campo Mourão, Paraná, Brasil.

<sup>5</sup> Institute for Biological Research "Siniša Stanković"- National Institute of Republic of Serbia, University of Belgrade, Boulevard Despota Stefana 142, 11000 Belgrade, Serbia.

\*eliana@ipb.pt; lillian@ipb.pt

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### Summary:

The food industry has been looking for natural matrices with potential application as natural ingredients. In this sense, the aim of this work was to characterize the *Brassica oleracea* var. *Acephala* biowastes, popularly known as kale, regarding its individual phenolic profile and biological action, in order to identify phenolic compounds with preservative and/or bioactive potential for incorporation in the food industry. The individual phenolic profile was obtained using spectrophotometric methods for an initial scan, and then HPLC-DAD/ESI-MSn was used for a detailed identification. The bioactive potential was evaluated through *in vitro* assays, analyzing the cytotoxicity in human tumor cell lines (AGS, CaCo-2, MCF-7, NCI-H460) and the hepatotoxicity in a non-tumor cell line (VERO), by the sulforhodamine B assay. The anti-inflammatory activity was studied in RAW 264.7 cells, the antimicrobial activity by the microdilution method, and the antioxidant activity by TBARS and CAA assays. The composition of phenolic compounds, namely the content of total phenols and total flavonoids, revealed a promising amount of these compounds, with concentrations of 5 mg GAE/g of total phenols and 2.4 mg EC/g of total flavonoids. The chromatographic analysis also showed the presence of several molecules with high interest and bioactive activity. Regarding the bioactivities of kale, it

was possible to observe an interesting antioxidant activity with concentrations of 19 µg/mL for TBARS and 2000 µg/mL for CAA providing 50% of this antioxidant activity and 40% of inhibition of lipid oxidation, respectively. The antimicrobial activity revealed promising results, highlighting that the bacteria *Bacillus cereus* and *Enterobacter cloacae* and the fungi *Aspergillus fumigatus* and *Penicillium fumiculosum* were the most susceptible to the effect of kale extract. Regarding the cytotoxic, anti-inflammatory, and hepatotoxic activities, the kale extract didn't revealed activity at the maximum concentration tested (400 µg/mL). Considering these results, kale biowastes have a rich composition in compounds of great interest that can be an industrial alternative. The use of by-products can be a solution to decrease the concentration of artificial additives in the food sector as well as to add value to residues increasing the income of the food industry.

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