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Editorial: Sustainable food systems in Ibero-America

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Editorial on the Research Topic
Sustainable food systems in Ibero-America

Sustainability and the search for products with improved functionalities that address the demands of the consumer for a healthier diet are the main challenges facing the development of a new trustworthy and healthy food production system. These topics, also addressed by the participants in the 3rd BioIberoAmerica 2022 conference (Braga, Portugal), have allowed for the publication of four original articles in this SI.

The article "Physicochemical, rheological and structural properties of flours from six quinoa cultivars grown in Colombia" by García-Parra et al. evaluates quinoa flours from six cultivars to be used for the formulation of different food products, such as beverages, baked goods, snacks, pasta, and others, acting as nutritional improvers and modifiers of rheological, textural, and functional properties. The obtained characterization validates the use of quinoa, a gluten-free cereal, which has high potential to supply the different needs of the population and the processed food industries.

The articles "Valorization of by-products from vegetable oil industries: Enzymes production by *Yarrowia lipolytica* through solid state fermentation" by Costa et al. and "Active aroma compounds assessment of processed and non-processed micro- and macroalgae by solid-phase microextraction and gas chromatography/mass spectrometry targeting seafood analogs" by Moreira et al. address the use of food industry by-products as a sustainable alternative for the obtention of other compounds that can be further used with an added value in the production chain.

In the first article, considering the industrial relevance of oleaginous crops—with production expected to reach between 500 million tons between 2018 and 2020 and an associated large amount of by-products—three by-products from the extraction of olive, sunflower, and rapeseed oils are used as solid substrates in solid-state fermentation (SSF) for lipase and protease production.

This work demonstrates that enzyme production by *Y. lipolytica* W29 in SSF can be modulated by the different combinations of oil cakes in the substrate mixture. In addition, the potential of using by-products from vegetable oil industries in SSF processes is demonstrated, thus showing alternative strategies for their valorization.

In the second article, the odors of four algae were investigated and compared to evaluate the potential of these algae to mimic the aroma of shrimp. The relevance of this study comes from the need to develop non-animal-based food formulations (as new sources of proteins) with sensory properties that please the consumer. Moreover, the possibility of using algae and their processed resulting products as a shrimp flavor replacement in non-animal-based food formulations decreases the pressure on seafood crops and aquaculture-associated issues,

hence leading to more sustainable livestock. Overall, the data provided on the composition of volatile organic compounds in non-processed raw samples (r) and processed cooked (c) and cooking water (w) samples for two microalgae [*Nannochoropsis oceanica* (NO) and *Tetraselmis chuii* (TC)], two macroalgae [*Ulva rígida* (UR) and *Saccharina latíssima* (SL)], and shrimp *Vannamei cong* (SH), although showing significant differences between micro and macroalgae species, indicate that the cooking water and cooked samples are very similar in the key components of their odorants and similar to shrimp odor.

The article "Tunning pectinase activity under the effects of electric fields in the enhanced clarification of wine must" by Queirós et al. describes, for the first time, the effects of moderate electric fields (MEF) and electrical frequency on the activity of pectinase (PEC) in the accelerated clarification of "Vinho Verde" must. The results obtained support the possibility of, under the applied electric fields, conducting the winemaking process at a low temperature (<20°C) and leveraging the fruitiness and herbaceous aromas of white wine by retaining its fruity acetate esters. Moreover, the clarification of wine or wine must when performed at a low temperature can prevent spoilage, maintain organoleptic stability and nutritional properties, and contribute to energy saving. The results from this study reveal that MEF can support pectin hydrolysis below the optimal temperature range of PEC by reducing its Ea (activation energy) and decreasing the initial pectin content by 42%. Moreover, MEF technology can be supported by a renewable source of energy, thus presenting an element of environmental sustainability.

In summary, these four articles represent the galvanization of the high scientific quality contributions presented at the 3rd BioIberoAmerica Congress, showing the relevance of the Ibero-America region in performing cutting-edge work in biotechnology.

Author contributions

Both authors contributed equally to the writing of the manuscript.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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