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Valorization of Olive-waste cake aqueous extracts by tight ultrafiltration and nanofiltration membranes

Olive-waste cake is a by-product of the Olive oil extraction recognized as a rich resource of phenolic compounds (about 45% of the original Olives' phenolic content). Recently, in relation to the major interest for natural compounds with biological activities, the interest in the separation and purification of polyphenols from these wastes has remarkably grown. Indeed, polyphenols have been associated with a multitude of health beneficial effects possibly preventing damages and diseases caused by oxidative stress. Pressure-driven membrane processes has been largely investigated in the last years for reducing the organic load of agro-food wastewaters and for recovering of high-added value compounds. This work was aimed at investigating a sustainable process for the purification of polyphenols from Olive-waste cake. It was based on an aqueous extraction step of the Olive-waste cake followed by a fractionation/concentration step through the use of tight ultrafiltration (UF) and nanofiltration (NF) membranes. The aqueous extraction was studied on bench scale evaluating the effect of time and solid-liquid ratio on polyphenols recovery. The performance of flat-sheet polymeric membranes, with different molecular weight cut-off, was evaluated in terms of productivity and selectivity towards total phenols. Fouling index and cleaning efficiency were also analysed in order to determine process feasibility at industrial scale. The whole result allows selecting the suitable membranes to obtain formulations enriched in phenolic compounds of interest for functional foods and functional food ingredients. Preliminary results demonstrate that the combination of aqueous extraction and membrane systems is an effective method to extract and purify phenolic compounds from Olive cakes to produce products that are economically highly valued reducing at the same time environmental issues of Olive waste disposal.

Biography

Conidi Carmela has completed her degree in Pharmacy from University of Calabria in 2004 and her PhD in Methodologies for the development of molecules of pharmacological interest in 2009. She conducted Postdoctoral research at the Instituto de Ingeniería de Alimentos para el Desarrollo, Universitat Politècnica de València between the years 2011-2013. She is currently working at the Institute of Membrane Technology of CNR where she is involved in different research activities devoted to the purification and concentration of antioxidant compounds in products and by-products of food processing. She has published more than 40 papers in international journals and she is participant in different national and international projects.

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