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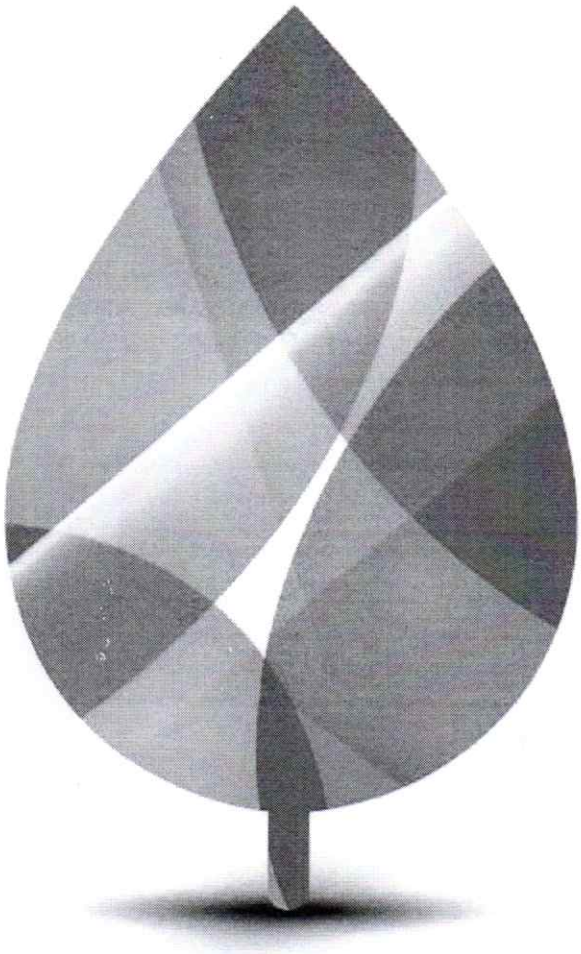

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O3 - PEF-ASSISTED GREEN SOLVENT EXTRACTION OF HIGH-ADDED VALUE COMPOUNDS FROM AGRI-FOOD BY-PRODUCTS

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Abstract

Extraction of valuable compounds from biomaterials of microbial, algae or plant origin is a crucial step for the use of these compounds in the food and pharmaceutical industries. In particular, the recovery of valuable compounds (natural colorants or nutraceuticals) from food wastes and by-products, which have been matter of concern by the agri-food industry due to their environmental impact, is gaining increasing interest in recent years. However, traditional extraction methods are generally very time-consuming and require large quantities of solvents in order to achieve sufficiently high extraction yield of target compounds from agri-food products. Moreover, these methods may do not comply with criteria of green chemistry concept, since they may require application of toxic organic solvents for the selective recovery of target compounds. Consequently, demand is increasing for extraction techniques that improve yield, shorten the extraction time and reduce the use of organic solvents.

Recently, the interest in Pulsed Electric Fields (PEF) treatment of plant material before extraction with solvent, has considerably grown, due to its ability to induce a selective permeabilization of the cytoplasmatic membranes (electroporation), facilitating the release of intracellular compounds from the cells.

This manuscript gives an overview of the PEF-assisted solvent extraction, and presents the experimental results on the recovery of antioxidants and pigments (phenolic compounds and anthocyanins) from red fruits and vegetables by-products, which can be used as potential food additives and/or nutraceuticals. The effects of PEF process parameters (field strength, total specific energy input), as well as individual green solvents (water, ethanol) or their mixtures on the extraction yield of the compounds of interest is discussed.