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O Presidente da República

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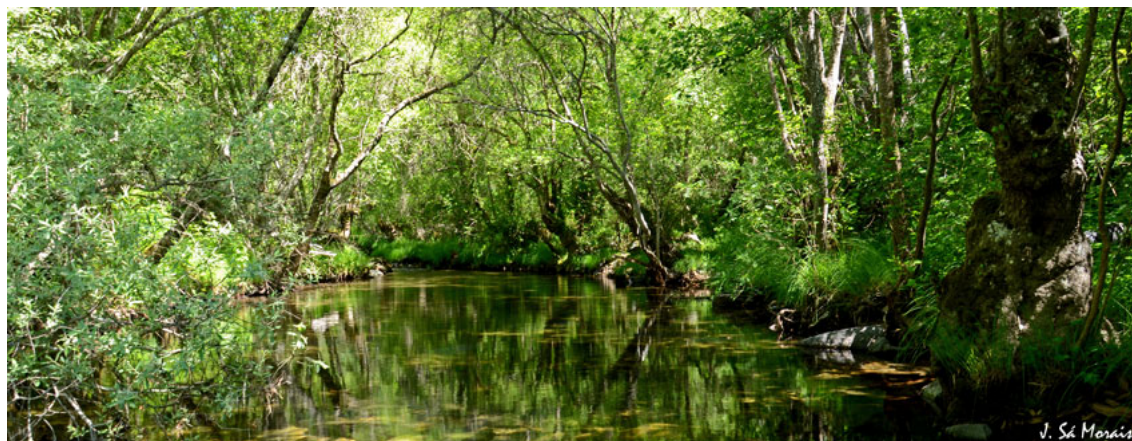
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Optimization of the extraction of phenolic compounds from walnut leaves using DES

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Deep eutectic solvents (DES) are a new generation of alternative solvents resulting from the mixture of two (or more) starting materials where the eutectic temperature of the mixture is considerably lower than the melting point of the individual components [1]. DES can be considered “designer solvents” due to the possibility of combining different hydrogen bond acceptors and donors, to obtain solvents with specific affinity to the target molecules. Among their many applications is the potential use of DES as both solvents and formulation media of extracts rich in phenolic compounds [2].

In this work, the heat assisted extraction of phenolic compounds from walnut leaves was optimized, using DES based on choline chloride (CC) and carboxylic acids. To evaluate the response, the main phenolic compounds present in the extract (acid 3-*O*-caffeyloquinic acid, quercetin 3-*O*-glucoside and quercetin *O*-pentoside) were determined by HPLC-DAD.

From a preliminary solvent screening, butyric acid (BA) and phenylpropionic acid (PPA) were selected as hydrogen bond donors. The extraction conditions (time, temperature and water content) were then optimized by an experimental design, assisted by response surface methodology. Water content was the most relevant extraction variable, followed by temperature and, lastly, extraction time.

Under the optimized conditions, it was possible to obtain a response of 37.9±4.0 mg/g dw for CC:BA and 31.7±4.2 mg/g dw, for CC:PPA. Compared to the traditional water + ethanol reference solvent, similar or higher extraction yields were obtained using the selected DES.

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