Research Article

Monitoring the oleuropein content of olive leaves and fruits using ultrasound- and salt-assisted liquid–liquid extraction optimized by response surface methodology and high-performance liquid chromatography

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1 Introduction

Sample preparation methods are used for enhancing the sensitivity and selectivity of analysis techniques [1–3]. The obtained sample in this step should have a high concentration of target analytes free of interfering compounds from the matrix. Therefore, the extraction of target analytes from a sample matrix is one of the most important steps in a sample preparation process.

Natural products extraction is usually performed with solid–liquid extraction (SLE) techniques including maceration, Soxhlet extraction (SE), supercritical fluid extraction (SFE), accelerated solvent extraction (ASE) and distillation methods, due to the use of a large volume of extracting solvent and the incompatibility of most of these solvents with analytical instrument, evaporation to dryness and reconstitution of the extract in a very small volume of appropriate solvent are necessary [9–11]. Consequently, an increasing demand for the extraction of natural molecules by a clean and green extraction method with safe solvents at low temperatures is observed. The use of ultrasound-assisted extraction (UAE) and microwave-assisted extraction (MAE) methods for the extraction of natural compounds in comparison with conventional solvent extraction techniques have several advantages such as higher extraction efficiency, small solvent volume, and acceleration in extraction process [12–16]. However, preconcentration and cleanup of extract may be necessary before analysis.

Keywords: Liquid chromatography / Liquid–liquid extraction / Oleuropein / Olive / Salt-assisted extraction / Ultrasound

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