



Accelerated Solvent Extraction (ASE): Influence of solvents and extraction conditions on lipids extracted from three different soils

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Accelerated Solvent Extraction (ASE) is an extraction technique combining high temperatures and pressures with liquid solvents. ASE has been compared to other extraction methods such as Soxhlet or sonication and this method has been presented as a useful organic pollutant extraction method allowing the reduction of time and solvent consumption. Moreover several results indicate that ASE is an efficient method to soil lipids extraction. Despite some authors have evaluated ASE extraction for pollutants extraction in different matrix, few investigations concern the evaluation of soil lipid extraction.

In contrast many studies deal with soil lipids extracted using conventional techniques. Soil lipids are well known biomarkers of source and diagenesis of soil organic matter. Therefore the effect of different solvents, but also of temperature, on lipid extraction (efficiency, thermal degradation) would be useful to optimize soil lipids extractions. In addition, as soil organic matter including lipids, interact with minerals, soil texture may influence extraction efficiency.

We have estimated the influence of three different temperatures (60, 100 and 125°C) and different solvents and solvent mixtures on lipid extractions from three soils: a sandy cambisol, a clay loamy vertisol, a clayey alfisol. First, we have compared the quantity of the total extracted lipid from the different soils. Then, we examined the nature and quantities of the different lipid components extracted depending on the solvent used and the temperature by GC and GC-MS.

The quantification of the total extracted lipids evidences that the two tested parameters (temperature and solvent) influence the efficiency of the extraction. Moreover the characteristics (pH, mineral composition, CEC,...) of the different soils play an important role during the extraction process.

The extent of variation on the type of extracted compounds as revealed by GC and GC-MS was examined in relation with of solvent chemical properties.