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Data article

Extraction of phenolic compounds from extra virgin olive oil by a natural deep eutectic solvent: Data on UV absorption of the extracts

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ABSTRACT

This data article refers to the paper "Towards green analysis of virgin olive oil phenolic compounds: extraction by a natural deep eutectic solvent and direct spectrophotometric detection" [1]. A deep eutectic solvent (DES) based on lactic acid and glucose was used as green solvent for phenolic compounds. Eight standard phenolic compounds were solubilized in the DES. Then, a set of extra virgin olive oil (EVOO) samples ($n=65$) were submitted to liquid–liquid extraction by the DES. The standard solutions and the extracts were analyzed by UV spectrophotometry. This article reports the spectral data of both the standard solutions and the 65 extracts, as well as the total phenolic content of the corresponding oils, assessed by the Folin–Ciocalteu assay.

Specifications Table

Subject area	*Agricultural and biological sciences*
More specific subject area	*Green chemistry* *Analysis of phenolic compounds in vegetable oils*

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Type of data	*Figure, Excel files*
How data was acquired	*UV spectra: liquid–liquid extraction (or direct solubilisation for standard phenolic compounds) followed by UV absorption analysis (Agilent Cary 60 spectrophotometer, Agilent Technologies, Santa Clara, USA).* *Phenolic compounds content: liquid-liquid extraction followed by Folin-Ciocalteu assay*
Data format	*Pre-processed*
Experimental factors	*Oil samples were directly submitted to liquid-liquid extraction*
Experimental features	*A 6:1:6 lactic acid:glucose:water DES was prepared. Standard phenolic compounds were directly solubilized in DES. Each oil sample was submitted to both water-methanol and DES extraction in duplicate. Water/methanol extracts were submitted to the Folin-Ciocalteu assay for determination of phenolic compounds content. DES extracts were submitted to direct UV absorption analysis*
Data source location	*Bari, Italy*
Data accessibility	*Data is provided with this article*

Value of the data

- This data is available for spectrum processing
- UV spectra of some standard phenolic compounds solubilized in the DES under investigation are available for spectra comparisons and evaluation of spectroscopic properties of phenolic compounds
- Multivariate analysis can be carried out on the data to obtain models to relate the phenolic compounds content (assessed by Folin–Ciocalteu assay on water–methanol extracts) with spectral properties of DES extracts

1. Data

Supplementary material S1 reports the UV absorption spectra in the range 252–360 nm of 8 standard phenolic compounds – belonging to different chemical classes: benzoic acid derivatives (hydroxybenzoic acid, protocathecuic acid, vanillic acid), cinnamic acid derivatives (*p*-coumaric acid, caffeic acid), phenyl-ethyl alcohols (tyrosol), flavonoids (apigenin), lignans (pinoresinol) – after solubilization in the DES based on lactic acid and glucose.

Supplementary material S2 reports the phenolic compounds content, expressed in mg gallic acid/kg oil, of the 65 EVOO samples.

Supplementary material S3 and Fig. 1 report the UV absorption spectra in the range 252–360 nm of the DES extracts of the 65 EVOO samples. Mean spectra of the two independent extractions after sample weight normalization are reported.

2. Experimental design, materials and methods

2.1. Reagents and samples

Glucose ($\geq$ 99.5%), lactic acid (90%), methanol ($\geq$ 99.8%), Folin–Ciocalteu reagent, and phenolic standards were purchased from Sigma-Aldrich (Sigma-Aldrich Co. LLC, St. Louis, USA). Hexane ($\geq$ 95.0%) was purchased from Carlo Erba reagents (Carlo Erba reagents, Milan, Italy). Sodium carbonate was purchased from J.T. Baker (Avantor Performance Materials, Center Valley, USA). Sixty-five EVOO samples were obtained from producers and local sellers.