

**Title:**

Effect of drying treatment and extraction techniques on the total phenolic contents and antioxidant activity of Agiorgitico grape pomace

**Authors & affiliations:**

*Christina Drosou, Konstantina Kyriakopoulou, Magdalini Krokida\**

*School of Chemical Engineering, National Technical University of Athens  
Zografou Campus, Athens, GR-15700, Greece, email:  
mkrok@central.ntua.gr*

**Abstract:**

Nowadays, viticulture industry faces a disposal problem for grape pomace and the utilization of grape waste in alternative areas is considered crucial. It is known that grape pomace shows high phenolic content which can be recovered by extraction. In the present study, the antioxidant potential and the total phenolic content of Greek wine pomace from Agiorgitico variety was investigated. Specifically, the grape pomace was extracted with soxhlet extraction (SE) using ethanol as solvent and green extraction processes, including microwave and ultrasound assisted extraction (MAE, UAE) using water/ethanol (1:1) or water as solvents to recover the antioxidant compounds contained in the matrix. Extraction techniques were performed in accelerated solar dried (ASDP), air dried (ADP) and untreated (UGP) samples in order to explore the effect of drying on the recovery of antioxidant compounds. The efficiency and selectivity of processes were determined in terms of extraction yield and antioxidant activity, as well as, phenolic content. The antioxidant activity was measured using the DPPH method and the phenolic content using the Folin-Ciocalteu assay. MAE water extracts exhibited the highest extraction yield both for UGP and DGP, reaching up to  $22.87 \pm 0.52\%$  d.b. On the other hand, UAE and MAE water: ethanol (1:1) extracts showed the highest antioxidant activity and total phenolic content for both UGP and DGP. Drying treatment seems to enhance the extraction of bioactive compounds from grape pomace. Specifically, DGP presented high extraction yield within short extraction time and exhibited higher antioxidant activity and total phenolic content than UGP. Solar dried agiorgitico extract showed the highest antioxidant ( $IC_{50}=0.36$  mg/mL) and phenolic content (172.68 mg GA/g extract), when extracted by UAE water: ethanol (1:1), showing that it can be considered a sustainable source of natural antioxidants and phenolic compound.