

Effect of Filtration Systems on the Phenolic Content of Virgin Olive Oils by HPLC-DAD-MSD

A.M. Gómez-Caravaca¹, L. Cerretani², A. Bendini², A. Segura-Carretero¹, A. Fernández-Gutiérrez¹, G. Lercker².

¹Department of Analytical Chemistry, Faculty of Sciences, University of Granada. C/Fuentenueva s/n, E-18071 Granada, Spain. ²Department of Food Science, University of Bologna. P.zza Goidanich 60, 47023 Cesena (FC), Italy.

The influence of the filtration system on the phenolic and water content of virgin olive oils that differed in the year of production, production system and the olive variety was measured. Samples were filtered in the laboratory using two different systems (cotton or filter paper plus sodium sulphate anhydrous). Qualitative and quantitative variation of the phenolic fraction of virgin olive oils was evaluated by HPLC-DAD-MS and correlated with their water content (by Karl Fischer titration) and oxidative stability under forced conditions (by OSI). Colorimetric assays were also carried out in order to calculate the effect of filtration on the visual characteristics of virgin olive oil. After filtration the oxidative stability index decreased and in particular, filtration with cotton showed a significant loss of hydroxytyrosol, a phenol endowed with high antioxidant activity. One interesting behavior was highlighted: filtration with either cotton or paper plus anhydrous sodium sulphate led to an apparent increase in the phenolic content. These apparently contradictory data could be explained by considering that the reduction of the water content permits a higher availability of phenolic compounds that remain in oil, and are extracted with the methanol-water mixture. Lastly, the filtration of virgin olive oil produced a loss in the intensity of green color and an increase in its lightness.