

Enhancement of Bioactive Phenols and Quality Values of Olive Oil by Recycling Olive Mill Waste Water

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Abstract Mature ‘Chondrolia Chalkidikis’ olives were processed in an industrial olive oil mill equipped with a three-phase decanter. Water was added to the decanter at a 1:2 water-to-paste ratio. Olive mill waste water (OMWW) was used to replace the added water at a rate of 50 or 100%. Following the final separation, the obtained oil was used for chemical analysis and sensory evaluation. All oils had similar acidity, peroxide and *K* values. OMWW-treated olive oils presented higher total phenolic content and higher antioxidant activity based on DPPH and oven tests, but lower chlorophyll and carotenoids content. However, there was no significant difference between the 50 and 100% replacement. The phenolic profile of the treated olive oils analyzed by quantitative ¹H NMR revealed more than twofold oleocanthal and oleacein as well as oleuropein and ligstroside aglycone contents than in the control. Sensory evaluation of treated oils also showed an enhancement of fruity, bitter and pungent attributes compared to the control.

Keywords Enriched olive oil · Waste water · Oleocanthal · Oleacein · Oleuropein · Bioactive phenols · Secoiridoids