

CHANGES IN PHENOLIC PROFILE OF OLIVE OILS WITH MALAXATION CONDITIONS AND OLIVE HARVEST

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This study evaluated the influence of olive varieties (Ayvalik and Memecik), harvest time (Early, Mid and Late) and malaxation temperature (27°, 37° and 47° C) on phenolic distribution of virgin olive oil. Quantification of phenolic compounds was done using HPLC-DAD and 16 phenolic compounds were identified, including hydroxytyrosol, tyrosol, pinoresinol, some phenolic acid such as p-coumaric, ferrulic, syringic, caffeic acids, and also high molecular weight flavonoids e.g. luteolin and apigenin. Influence of operating factors was determined using Anova (Minitab 16.0). Multivariate statistical analysis was also performed to differentiate the oil samples. Principal Component Analysis (PCA) and a more elaborate method, Partial Least Squares Discriminant Analysis (PLS-DA), clearly differentiated the oils based on olive variety and harvest time. Hydroxytyrosol of oils, obtained from mid-harvest olive and at 47°C temperature of malaxation was significantly higher. Memecik olive oil generally showed a higher tyrosol, pinoresinol, p-coumaric acid and luteolin at early harvest. Ayvalik oils indicated distinct phenolic profiles in the oil when obtained within early and mid-harvest. Pinoresinol content of Ayvalik olive oil was higher at 27°C malaxation of mid-harvest olive. PLS-DA precisely distinguished early harvest Ayvalik and early and mid-harvest Memecik olive oils regardless of malaxation temperature. However, mid and late harvest Ayvalik as well as late harvest Memecik oils appeared inseparable with respect to their phenolic profile. Results of data analysis showed that olive oils from different varieties, harvested at different times required varying malaxation temperature suitable for them, in order to obtain optimum level of phenolic compounds.

Keywords: Olive variety, harvest time, malaxation temperature

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