

# Characterization of Monocultivar Virgin Olive Oils from Marche Region

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The trend towards the valorization of regional products has lead botanists, chemists and oilmakers to rediscover local *cultivars* and to produce VOO from a single olive variety. The Marche region (Italy) accounts for less than 1% of the domestic VOO production, however several typical *cultivars* are diffused, such as Sargano di Fermo and Piantone of Falerone. The characterization of VOO from the local cultivars is important both for nutritional purpose and for the assessment of authenticity of VOO with protected designation of origin (PDO). Eleven monocultivar VOOs from Marche region were characterized for their phenolic profile, standard quality parameters (including the sensory analysis), total phenols by the Folin-Ciocalteu method (TP), fatty acid profile (FFAs), oxidative stability (Rancimat time) and total lipid profile (including the 1,2/1,3 diacylglycerol ratio). All the olives from 11 different cvs were harvested in a single plot of land located at the University farm in 2007. The olives were processed using a two-way continuous mill equipped with a metal crusher in a single plant and the resulting 11 monovarietal extra VOOs were separately bottled. The FFAs profile showed low variability: the oleic acid content ranged from 72 to 79% according to the olive variety. The phenolic profile obtained by high performance liquid chromatography-diode array detection confirmed by mass spectrometry (HPLC-DAD-MS/MS) showed that the preponderant phenolic compounds were the dialdehydic form of decarboxymethyl elenolic acid (EDA) linked to DHPEA or linked to *p*-HPEA (oleocanthal). A good correlation was found between Rancimat time and DHPEA-EDA and *p*-HPEA-EDA ( $R^2=0.85$  and  $0.71$ , respectively). FA and 1,2-OO/1,3-OO ratio ( $R^2=0.74$ ) were negatively correlated. Moraiolo, Rosciola and Coratina showed the highest stability towards forced oxidation due to the highest content of DHPEA-EDA, *p*-HPEA-EDA and oleic acid. Conversely, Pendolino, Marzio and Maurino showed the highest content of ligstroside aglycon in its oxidised form and thus the lowest Rancimat time. Rosciola and Coratina showed the highest content of triolein, low 1,2-OO/1,3-OO (diolein) ratio and high Rancimat time. Moraiolo was characterized by the highest intensity of olive fruitiness and herbaceous scent, whereas Marzio and Coratina were perceived as the most bitter and pungent oils among all.