

Effect of Crushing on Olive Paste and Virgin Olive Oil Minor Components

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Crushing of olives is not only a simple physical process to break the fruit's tissues and release the oil drops contained into the vegetal cell vacuoles, but it is also a critical step involved in the quality of the final virgin olive oil (VOO) produced. Indeed, upon olive crushing several enzymes involved in the generation and transformation of polar phenols and volatile compounds are triggered. Depending on crushing conditions, the concentration of these minor components intimately related with the taste, aroma and stability of VOO are therefore modified.

The present study focuses on the influence of crushing conditions on phenols and volatiles profile in olive pastes and their corresponding VOOs. Two different olive cultivars, Arbequina and Cornicabra, were processed using (i) hammer mills varying the applied breakage force and different grid hole diameters, (ii) a fruit cutter and (iii) by pressure.

The different technological trials affected the olive paste temperature during crushing and its minor compounds composition and profile and in consequence the organoleptic (taste, odour and colour) and stability characteristics of the final VOO. For instance, bigger hole diameter in the mill grid produced a lower olive paste temperature increase leading to VOOs richer in volatile compounds and poorer in polar phenols. Hammer mill was the most aggressive crushing technique, resulting into oils richer in phenolic compounds in comparison with the cutter and pressure methods, which volatiles compounds were generally higher.

Keywords: crushing, hammer mill, phenols, volatiles, virgin olive oil