

Poster

Biochemical and molecular characterization of olive β -glucosidase in seven olive varieties during the ripening process: the role of β -glucosidase in determining the phenolic content of virgin olive oil.



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ABSTRACT

Virgin olive oil (VOO) is one of the essential components of the Mediterranean diet, which includes a series of cultural habits, especially alimentary, shared to a greater or lesser extent, by all countries lapped by Mediterranean Sea. VOO is enriched with bioactive compounds which are related to its unique organoleptic characteristics, and also to its antioxidant properties, which have been associated to with the reduction of risk to suffer cardiovascular diseases and to a protective effect against cancer. The most important bioactive components in VOO are phenolics compounds [2].

The phenolic composition of VOO is closely related to the content of phenolic glycosides initially present in the olive tissue. In parallel, some studies indicate that there is a positive correlation between the activity levels of β -glucosidase in the olive fruit and the final content of phenolic compounds in VOO. This enzyme plays a key role hydrolyzing phenolic profile of VOO. In consequence, its biochemical and molecular characterization is of great interest from a biotechnological point of view [1, 2].

In this study, seven olive varieties (Abou-Kanani, Dokkar, Klon-14, Menya, Picual, Piñonera y Shengeh) with different phenolic contents have been selected in the World Olive Germplasm Bank. The phenolic profiles of fruits harvested at different ripening stages and their oils have been analyzed by HPLC and at the same time β -glucosidase activity has been measured in olive fruits at different ripening stages. The methods for β -glucosidase extraction and activity assessment have been optimized. Spectrophotometric activity assays have been carried out with the synthetic substrate p-nitrophenyl galactoside (p-NPG) using a calculated molar extinction coefficient ($\epsilon=552,8 \text{ M}^{-1}\text{cm}^{-1}$) for the p-nitrophenyl liberated in the reaction medium. The results obtained show that olive varieties with the highest content of phenolic glycosides in the fruit such as Piñonera, Dokkar or Menya, also have the largest β -glucosidase activity levels, which usually decrease ripening process. These results will be completed with the pertinent studies of gene expression [3].

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