

SNP ANALYSIS OF *OLEA EUROPAEA* LUPEOL SYNTHASE GENE

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Higher plants produce a wide range of non-steroidal triterpenoids. Their functions in plants are still unknown, but they have important biological properties for human health. Sterols and non-steroidal triterpenoids are products of the cytoplasmatic acetate/mevalonate pathway, and the 2,3-oxidosqualene is their common precursor. A group of enzymes, called triterpene synthases, utilizes the oxidosqualene as substrate to produce different triterpenes (Stiti et al., 2007).

Olive (*Olea europaea* L.) trees synthesize many different sterols and triterpenoids, as the oleanolic acid. Thus, it is of great importance to understand their regulating mechanisms of synthesis and the differences about this pathway among cultivars.

Lupeol synthase is a key enzyme for the oleanolic acid synthesis and his cDNA sequence and enzyme function have been previously identified in olive (Shibuya et al., 1999).

The aim of this work was to analyze the Single Nucleotide Polymorphisms (SNPs) of the lupeol synthase gene in olive cultivars to get information about the DNA sequence differences among varieties and about the structure and organization of the gene. The obtained data could be utilized to clarify the phylogenetic relationships among cultivar and to establish possible relationships between mutational events and different triterpenoid content.

After the identification of the entire genomic sequence of the lupeol synthase gene, a fragment of 524 base pairs was analysed on 80 olive cultivars. All the amplicons were sequenced and analyzed: ten SNPs and 14 different aplotypes were identified.

In order to evaluate the presence of multiple lupeol synthase loci in the olive genome, the analyzed sequences were cloned from some cultivars and sequenced in order to calculate the aploptype number. The results indicate the presence of two different loci of the lupeol synthase gene in olive.

References:

Stiti N. et al., (2007) *Lipids*, 42: 55-67

Shibuya M. et al., (1999) *Eur. J. Biochem.*, 266: 302-307