

EVALUATION OF PHENOLIC AND VOLATILE PROFILES FROM STRAWBERRY GENOTYPES USING CHROMATOGRAPHIC TECHNIQUES

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Abstract: Strawberry (*Fragaria × ananassa*) is the most widely consumed berry fruit worldwide, with its consumption rising annually due to its exceptional sensory and nutritional characteristics. Numerous studies have been conducted on volatile and non-volatile compounds in strawberry, with the former contributing greatly to its unique aroma and the latter being responsible for the high nutritional value and its intense colour [1,2]. Among the wide variety of non-volatile compounds, polyphenols stand out, which have the ability to act as antioxidants. In the present work, the profiles of phenolic and volatile compounds of 25 strawberry genotypes cultivated (harvest time point, December 2021) at Berryplasma World Ltd. plantations (Varda, Iliá, Western Greece) have been monitored in parallel using liquid- and gas chromatography–mass spectrometry, respectively. Thus, a total of 26 phenolic compounds were detected after refining their separation by testing a wide range of chromatographic conditions. Among them, 21 were identified by comparison of MS spectral data with those of relevance in the literature. The main non-volatile categories, found in the analyzed strawberry genotypes, include anthocyanins, such as pelargonidin 3-O-glucoside and cyanidin 3-O-glucoside; proanthocyanidins, such as procyanidin dimers and trimers; flavan-3-ols, such as catechin and epicatechin as well as hydroxycinnamic acids, such as cinnamoyl glucose and *p*-coumaroyl hexose. Concerning the volatile organic compounds (VOCs), more than a hundred of different volatile components were identified and quantified in terms of peak areas. Those with a content of at least 0.1% were selected to study variations among different cultivars. Based on the average values obtained after the meticulous analysis of all genotypes, it was observed that such VOCs consisted mainly of 4.1% esters, 6.5% terpenes, acids (17.5% short-chain acids; 3.0% fatty acids), phenylpropanoids (41.0%), as well as lactones (6.7%) and furanones (4.1%). Further investigations are ongoing in our research group to determine the volatile and non-volatile chemical composition of same strawberry genotypes at different maturation stages.

Key words: *Fragaria x ananassa*, phenolic compounds, VOCs, LC-MS, GC-MS.

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