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Screening of Greek Chestnut Honey by LC/Q-TOF/HRMS: Phenolic compounds as Biomarkers †

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Abstract: European chestnut tree (Castanea sativa Mill.) is widespread in the mountainous areas of Greece. Chestnut honey is usually derived from flower nectar, as well as honeydew secretions. In Greece, chestnut honey is rather rare, accounting for less than 5% of the annual production. However, it has particular organoleptic characteristics (bitter, sweet, burnt caramel and, woody flavor) making it. Also, several studies have shown important properties for humans, some of them attributed to the high content of phenolic components. Based on the features, this rare type of honey is gaining commercial and export interest in both local and international markets. The purpose of this study was to investigate the phenolic compounds of acetonitrile fraction using liquid chromatography combined with time-of-flight high-resolution mass spectrometry (LC/Q-TOF/HRMS). So, five monofloral samples of chestnut honey were provided directly from beekeepers and their botanical origin was confirmed by physicochemical and melissopalynological analysis. The samples were then subjected to solid-phase extraction (SPE) and the extracts were analyzed by LC/Q-TOF/HRMS. At least 28 phenolic components were arranged using standard substances. Naringenin, protocatechuic acid, chrysin, ellagic acid, and pinocembrin were detected in greater abundance, with the former being proposed as a possible botanical marker. Furthermore, p-coumaric acid, which is mentioned in the literature as the main phenolic compound of chestnut honeys, was found in sufficient quantity, while ferulic acid, which is considered its marker, was not found in significant quantities in the present study. Particular reference can be made to caffeic and 4-hydroxybenzoic acid, which have been found in moderate abundance and have been reported as two of the basic phenolic components of this honey. Since chestnut honey contains a significant number of bioactive compounds which could potentially be useful in a balanced diet, it is important to identify compounds that could be used for the authentication of the monoflorality of chestnut honey.

Keywords: Chestnut Honey; solid-phase extraction; phenolic compounds; LC/Q-TOF/HRMS

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