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UPLC-MS method for the simultaneous determination of polyphenols in honey using MWCNTs as extraction sorbents

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An ultra-performance liquid chromatography-mass spectrometry (UPLC-MS) method has been developed for simultaneous separation, identification and determination of twenty two polyphenols in various floral sources of honey from Yemen. Solid phase extraction technique was used for extraction of the polyphenols from honey samples, while multiwalled carbon nanotubes were used as solid phase adsorbent. The chromatographic separation of all polyphenols was performed on a BEH C18 column using a linear gradient elution with a binary mobile phase mixture of aqueous 0.1% formic acid and methanol. The quantitation was carried out in selected reaction monitoring acquisition mode. The total amount of phenolic acids, flavonoids and other phenols in each analyzed honeys were found in the range of 338 to 3312, 122 to 5482, and 2.4 to 1342 $\mu\text{g}/100\text{ g}$ of honey, respectively. 4-hydroxybenzoic acid was found to be the major phenolic acids. The main detected flavonoid was chrysin, while cinnamic acid was found to be the major phenols compound. The regeneration of solid phase adsorbent to be reused and recovery results confirm that the proposed UPLC-MS method could be potentially used for the routine analysis of polyphenols in honey extracts.

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