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PHENYLAMIDES IN FOOD: UHPLC/QTOF/MS IDENTIFICATION AND STRUCTURAL ELUCIDATION

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Ultra-high-performance liquid chromatography coupled with quadrupole time-of-flight mass spectrometry (UHPLC/Q-ToF/MS) is a powerful technique that has been used for target and untarget analysis of various bioactive compounds in food and plants. The Q-ToF detector (quadrupole and ToF mass analysers) have unique characteristics (high resolution, fast acquisition, wide mass range, and high ion mobility), which enables its application for identification and structure elucidation of biocompounds. In addition to phenolic compounds, various phenylamides are being increasingly analyzed recently, due to their health benefits such as neuroprotective (agents for treatment of Alzheimer's and Parkinson's diseases), anti-aging, anti-cancer, antioxidative, anti-inflammatory and anti-microbial effects. Phenylamides exist as polyamine (putrescine, spermidine and spermine) or arylmonoamine (tyramine, tryptamine, dopamine, serotonin, octopamine, agmatin) conjugates connected with various phenolic acid moieties, and some of them present very important metabolites of plants and pollen grains. This review is primarily focused on the application of UHPLC/Q-ToF/MS technique for identification of various phenolic acid-polyamine derivatives, as well as their recently confirmed glycosylated forms. These phenylamide derivatives have characteristic MS fragmentation in positive ionisation mode, which can be used for prediction of their structures. Typical MS fragments can indicate the type of polyamine core, phenolic acid moieties (coumaroyl, caffeoyl, dihydrocaffeoyl, feruloyl, sinapoyl) and their positions on the polyamine core, as well as degree/position of glycosylation. Identification of phenylamides is additionally explained on several representative examples (derivatives) detected in tomato leaves, pollen samples and red goji berry. The use of this technique in the analysis of food enriched with phenylamides, as well as their behaviour during *in vitro* digestion, is also considered. Finally, this review points out advantages and limitations of UHPLC/Q-ToF/MS technique for identification of phenylamides with the tendency to facilitate the future characterization of these derivatives.

Keywords: phenylamides, UHPLC Q-ToF MS, food, spermidine, spermine

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