
LCXLC IN FOOD ANALYSIS

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High performance liquid chromatography (HPLC) has acquired a role of great importance in food analysis, as demonstrated by the wide variety of applications reported. Whilst single column chromatographic processes have been widely applied for real-world sample profile elucidation, in this area, providing high degrees of resolving power, they frequently approach or exceed their limits, especially when applied to matrices presenting a high level of complexity. As a consequence, despite a careful method optimization procedure, conventional HPLC may sometimes result inadequate. Moreover, peak overlapping may occur even in the case of relatively simple samples, containing components with similar properties.

Comprehensive two-dimensional liquid chromatographic (LCxLC) can represent a good alternative to overcome limitation of monodimensional HPLC in the field of food analysis.

LCxLC techniques can be considered innovative methods only recently developed and adopted in many configurations. The revolutionary aspect of comprehensive two-dimensional techniques, with respect to classical multidimensional chromatography, is that the entire sample is subjected to the two dimensional separations. The major benefit is that the separation capacities of each dimension are multiplied, offering a high peak capacity to resolve samples of great complexity. The advantage of LCxLC can be further exploited if a detector with identification capabilities is combined to the comprehensive LC system.

Many different applications have been developed in our laboratory, for the analysis of carotenoids, polyphenols, lipids and tryptic digests, and will be presented in this contribution.

Applications were run on a fully automated LCxLC system, configured around electronically activated multiport valves for within-loop automated fraction collection/re-injection, equipped with four dual plunger high pressure (660 bar) pumps and interfaced to DAD and *via* ESI to a hybrid Ion-Trap Time-of-Flight mass spectrometer (IT-TOF) for accurate mass determination and selective fragmentation of target molecules.