HYPHENATION AND HYPERNATION. THE PRACTICE AND PROSPECTS OF MULTIPLE HYPHENATION FOR THE ON-LINE STRUCTURAL INVESTIGATION OF PLANT METABOLITES

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The introduction of LC-hyphenated techniques (LC/UV-DAD, LC/MS and LC/NMR) in phytochemical analysis is changing our approaches of classical phytochemical studies. These powerful analytical techniques combine the high resolution efficiency of HPLC with the important identification potential of the associated spectroscopic detection methods. They enable the partial or sometimes the complete on-line identification of natural products in complex matrices such as crude plant extracts. In combination with LC-bioassays, efficient dereplication procedures, based on these techniques, give the possibility to rationalize the bioactivity-guided isolation approaches. They represent thus a strategic element to avoid finding known constituents and to target the isolation of new bioactive compounds. These methods give also a unique possibility to study unstable compounds which rapidly degrades or which are not separable at a preparative level.

LC-hyphenated techniques are also extremely useful for metabolomic studies. Indeed the use of LC-MS, in particular, in conjunction with efficient comparison algorithms, permit the precise detection of small metabolic modifications that occur upon stress induction in plants.

In this paper the possibilities and limitations of a LC-multihyphenated approach in phytochemical analysis as well as future development expected in this field will be discussed. An example of on-line identification of the main Arabidopsis thaliana constituents in the context of metabolomic applications will be presented.

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