

ANALYSIS OF PHENOLIC COMPOUNDS IN PLANT FOODS AND BEVERAGES BY ON-LINE DERIVATIZATION HPLC+HRGC-MS MULTIDIMENSIONAL SYSTEM

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Phenolic compounds are almost ubiquitous in plant material such as cereals, vegetables, fruits, legumes nuts and herbs but also in plant beverages such as wine, beer, tea and cocoa. Their levels vary greatly even between cultivars of the same species. Recent interest in food phenolics has increased greatly because of the antioxidant and free radical-scavenging abilities associated with some phenolics and their potential effects on human health.

Flavonoids represent the most common and widely distributed group of plant phenolics. They occasionally occur in plants as aglycones, although they are most commonly found as glycoside derivatives. To determine individual flavonoid glycosides in plant materials, the glycosides are hydrolyzed to identify and quantify the resulting aglycones. A number of analytical methods have been proposed for the separation and determination of phenolic compounds, mainly based on LC-DAD or recently LC-MS/MS. However, GC-MS can provide an easier identification of compounds through available libraries, although analysis of some phenolic compounds by GC-MS presupposes off-line and tedious derivatization steps.

In this work, an evaluation of the automated on-line derivatization KONIK HPLC+HRGC-MS Multidimensional System is presented for screening phenolics in plants (cocoa, aromatic plants) and beverages (wine, cocoa and tee). After sample extraction and acid hydrolysis if necessary, the samples were injected into an HPLC column (C18) to remove matrix interferences. Afterwards, target analytes (phenolic acids and catechins), eluted in a compact fraction from HPLC column, were transferred thorough TOTAD[®] interface to the GC injector. Finally, an on-line automatised derivatization step was performed in the interface trap to silylate the compounds before GC-MS determination. Quality parameters of the optimised method such as linearity, precision and LODs are given and compared to those provided by HPLC-DAD method.