

Rapid Microextraction Techniques Coupled with LC-MS/MS for Environmental Samples Analysis

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In routine testing laboratories, sample processing and pretreatment are the most tedious and time-consuming aspects in the entire procedure of analyzing target analytes in complex samples. Therefore, the necessitate for simple, quick, sensitive, selective, low-cost and efficient sample preparation techniques coupled analytical methods for food and environmental analysis, grabbed much attention of researchers to focus on new sample preparation (microextraction) techniques which can overcome the disadvantages of traditional sample preparation methods. Our research group interests are mainly focused on the development of novel sample preparation techniques for the complex sample analysis prior to the mass spectrometric analysis. In this study, we present a rapid analytical methodology for the determination of pesticides in complex samples using a novel liquid phase microextraction technique coupled with high-performance liquid chromatography/ tandem mass spectrometry (LC-MS/MS). Specific universal pesticides were chosen as target analytes and determined by LC-MS/MS with electrospray ionization and multiple reaction monitoring (MRM). Separation of target analytes was carried out using C18, 3 μ m, 4.6 \times 150 mm column with water and acetonitrile as mobile phase solvents and the column flow rate of 0.50 mL/min. Various experimental conditions including factors affecting the extraction efficiencies were thoroughly optimized. Under the optimal conditions, the method limit of quantifications are in the range between 0.05 ppb to 0.5 ppb. The linear coefficients found to be higher than 0.995 for all the target analytes. The developed method was applied to real samples analysis and found extraction recoveries were ranged from 80% to 120%. This presented method is proven to be a simple, highly selective, efficient, and sensitive analytical method and it can be used in routine food monitoring laboratories for pesticides analysis.