

Large-Scale multiresidue methods for pesticide residue methods and their degradation products in food by advanced liquid chromatography mass spectrometry

AR Fernandez-Alba.

Pesticide Residue Research Group. EU Community Reference Laboratory. University of Almeria, 04071 Almeria (Spain). E-mail: amadeo@ual.es

The international trade in fresh fruits and vegetables is an important issue within the European Union. For this reason, a large number of well known and frequently applied pesticides have been banned in the European Union as a consequence of Directive 91/414/EEC ([Council Directive, 1991](#)) and ([Regulation EC, 2005](#)). However, as a consequence of the lack of international harmonization due to diverse Good Agricultural Practices (GAPs) applied by countries around the world - as well as different additional EU limitations on the use of pesticides - a great number of pesticides which are banned in Europe, are still allowed in third countries. Moreover, the misuse of pesticides under EU regulations is not only related to third countries but also to bad application of the EU GAPs established within Europe itself. Recent alerts reported by European countries have pointed out serious problems related to the presence of illegal or misused pesticides in fresh crops.

Current analytical methodologies applied to pesticide residue food control are based on the concept of “target analysis”, where liquid or gas chromatography-tandem mass spectrometry (GC-MS/MS, LC-MS/MS) in the selected reaction monitoring mode (SRM) are very powerful techniques and currently the primary choice in food control laboratories. They are very powerful techniques and currently the primary choice in food control laboratories. The combination of well known Multiresidue Methods (MRMs) such as Quechers, Ethyl Acetate or Luke followed by new GC-MS/MS and LC-MS/MS technologies can performed the analysis of hundreds of pesticide residues in a reasonable time (eg: 40 min) with very good sensitivity and accuracy.

However, such approaches, taking into consideration that there are around 800 compounds present on the market, can overload the capabilities of many food control laboratories. Therefore, other possibilities become necessary in many cases for large scale MRMs. One efficient strategy is to apply mass screening procedures based on the new mass technologies available.

In this work, we present the results obtained by the application of such MRMs methods by applying LC-QqQ-MS and LC-TOF-MS based approaches.