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Determination of drugs of abuse and related compounds in sewage water by liquid chromatography coupled to high resolution mass spectrometry

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Wastewater-based epidemiology is a new field of research in which analysis of concentrations of biomarkers of drugs in domestic wastewaters is used to back calculate human consumption of the drugs. Liquid chromatography coupled to mass spectrometry has been successfully used to estimate and compare consumption of illicit drugs and counterfeit medicines in European city populations. Apart from target screening of classical drugs like cocaine and amphetamine the presence of new psychoactive substances (NPS, designer drugs) can be screened in wastewater, e.g., during festivals and other big events, using high resolution MS. For this purpose, a qualitative screening method based on liquid chromatography-quadrupole time-of-flight mass spectrometry (LC-QTOF MS) was applied for the detection and identification of stimulant-type NPS in wastewater. Eight 24-h composite influent wastewater samples were collected at the wastewater treatment plant (WWTP) serving the catchment area of Amsterdam in 2012 and 2014, during two events that each brought 300,000 visitors to the city.

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Multi-mycotoxin determination in rice collected from Serbia using ultra-high performance liquid chromatography coupled to triple quadrupole mass spectrometry

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As a crude extract method followed by ultra-high performance liquid chromatography–tandem mass spectrometry (UHPLC–MS/MS) is a technique that has been frequently used as a routine analytical technique for mycotoxins in wheayt and corn, which applicability has been also demonstrated successfully on other matrices by the team, the intention of this presentation was to further provide the evidence on the method applicability for mycotoxin analysis of rice samples, for UHPLC–MS/MS represents the most efficient and reliable analytical technique for high efficiency isolation, unequivocal identification and accurate quantification. Thus, in present investigation, a reliable UHPLC–MS/MS method was developed and validated for simultaneous determination of twelve mycotoxins (aflatoxin B1, aflatoxin B2, aflatoxin G1, aflatoxin G2, ochratoxin A, zearalenone, T-2 toxin, HT-2 toxin deoxynivalenol, citrinin, fumonisin B1 and fumonisin B2) in rice. One-step extraction using solvent mixtures of acetonitrile/water/acetic acid (79:20:1, v/v/v) without anyclean-up (i.e. crude extract method) was employed for themycotoxinsextraction from rice samples. Using matrix-matched calibration it has been demonstrated that the limits of quantification were below the relevantmaximum contents established by theEU regulation in rice or other cereals. The recoveries of the developed method were satisfactory between 96%–126% with relative standard deviation lower than 12%. The validated method was applied on real samples. The obtained results are used to estimate the exposure of theSerbian population to mycotoxins. To the best of our knowledge, this is the first report onoccurrence of the studied mycotoxins in ricecommercially availablein Serbia.

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