

SCREENING OF RECENTLY SEIZED NEW PSYCOACTIVE SUBSTANCES IN URINE OF POTENTIAL CONSUMERS AND URBAN WASTEWATER

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New Psychoactive Substances (NPS) are constantly being developed as legal substitution of traditional drugs of abuse. Although the traditional drugs maintain popular, new drugs are regularly introduced, changing the drug market ceaselessly. Monitoring NPS and its consumption is challenging as these compounds are normally missed in routine drug analysis. Users do often not exactly know what they consume and information available is limited of what is being sold. Furthermore, very little information exists on metabolism of these newly introduced NPS. This highlights the need of applying a strategic workflow making use of modern analytical techniques to face this novel public health safety challenge. The workflow presented in this work consists of three stages: i) the creation of a database including approximately 200 NPS. These NPS were recently reported to the National Early Warning Systems (EWS) of Spain and Italy and the EWS of the European Monitoring Center for Drugs and Drug Addiction (EMCDDA). ii) The collection of urine samples of individuals suspected of drug consumption, pooled urine samples from festivals and urban wastewater samples. iii) The screening of NPS using ultra-high performance liquid chromatography coupled to high resolution mass spectrometry with a hybrid quadrupole time-of-flight mass analyzer.

Although the database is under constant development, including NPS reported to be present in wastewaters around Europe, new compounds appearing in the market, as well as metabolites reported in the literature, the workflow applied allowed the detection of several unchanged NPS in urine and pooled urine samples. In several cases, NPS were also detected in wastewater samples, which indicates that consumption of some of these compounds is elevated. The absence of reference standards for several NPS found, as well as for some NPS metabolites, made it unfeasible the full confirmation of some compounds in the urine/wastewater samples analyzed. However, accurate-mass full-spectrum data provided by HRMS allowed their tentative identification with high degree of reliability. The subsequent acquisition of reference standards, when available, will allow the unequivocal confirmation of their identity.