



Highlights of Analytical Sciences in Switzerland

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Drug Checking: Glimpse into the Recreational Drug Market in Switzerland

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Drug checking services (DCS) allow recreational drug users to have drug samples chemically characterized. For the DCS *Drogeninfo Basel* (DIBS) analyses are conducted at the Institute of Forensic Medicine Basel. During sample collection, the visitors, who remain anonymous throughout, are obligated to conduct a nationwide questionnaire and professional counseling. After three days, the visitors are informed about the identity and purity of the sample. During the pilot phase (mid-2019 to mid-2022), 744 samples have been issued for analysis at the DIBS with cocaine being the most commonly analyzed drug (25%).

For the analysis, high-performance liquid chromatography coupled to a diode array detector (HPLC-DAD) is used. This method is validated for the quantification of over 20 analytes, spanning most important scheduled drugs (e.g. amphetamines and cocaine) and adulterants (e.g. caffeine, levamisole, phenacetin). In cases of ‘designer drugs’, further technologies are often required. Thus, gas chromatography coupled to mass spectrometry, GC coupled to vapor phase infrared spectroscopy (GC-IR), HPLC coupled to high-resolution mass spectrometry (HPLC-HRMS), and attenuated total reflectance IR (ATR-IR) are regularly applied.

In 2020, the emergence of low-tetrahydrocannabinol (THC) cannabis treated with synthetic cannabinoids (SCs) was observed in Switzerland. Such products were sold to users who believe that they are purchasing regular marijuana. SCs are potent synthetically produced compounds which act at the same target in the human brain as THC (the main active ingredient of cannabis) but have significantly aggravated risk profiles. Consequently, these novel adulterated products raised serious public health concerns. DCS enabled the rapid detection and monitoring of this trend, which has recently seen a significant drop in numbers. In 2020, a comprehensive qualitative screening method targeting over 60 SCs was developed and validated using HPLC-HRMS.

State-of-the-art technologies (e.g. GC-IR and HPLC-HRMS) and continuous development efforts are needed to react to the ever-changing illicit drug market in the context of DCS.

Reference

M. C. Monti, J. Zeugin, K. Koch, N. Milenkovic, E. Scheurer, K. Mercer-Chalmers-Bender, *Drug Testing and Analysis* **2022**, *14*, 1026, <https://doi.org/10.1002/dta.3220>.



MDMA-tablet containing 167 mg MDMA. Thorough documentation of tablets is required to be able to issue warnings that are made publicly available through diverse channels.



Cannabis and hashish samples found to contain the synthetic cannabinoid MDMB-4en-PINACA. To distinguish treated from untreated products, chemical analysis is required.

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