



„PARTY DRUGS“ TESTING ON THE DANCE FLOOR: EQUIPMENT, METHODS AND RESULTS

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Introduction

Since 1998 the mobile lab unit of the Health Office (Health, Social and Integration Directorate of the Canton of Bern, Switzerland) is testing so called „Party Drugs“ on the dance floor. At more than 310 events the team has tested over 7900 samples in cooperation with „Drogeninformationszentrum (DIZ)“ Zurich, „Contact Berne“, „Suchthilfe Region Basel“, „Prémire ligne“ Geneva and „Drogeninformation Luzern (DILU)“.

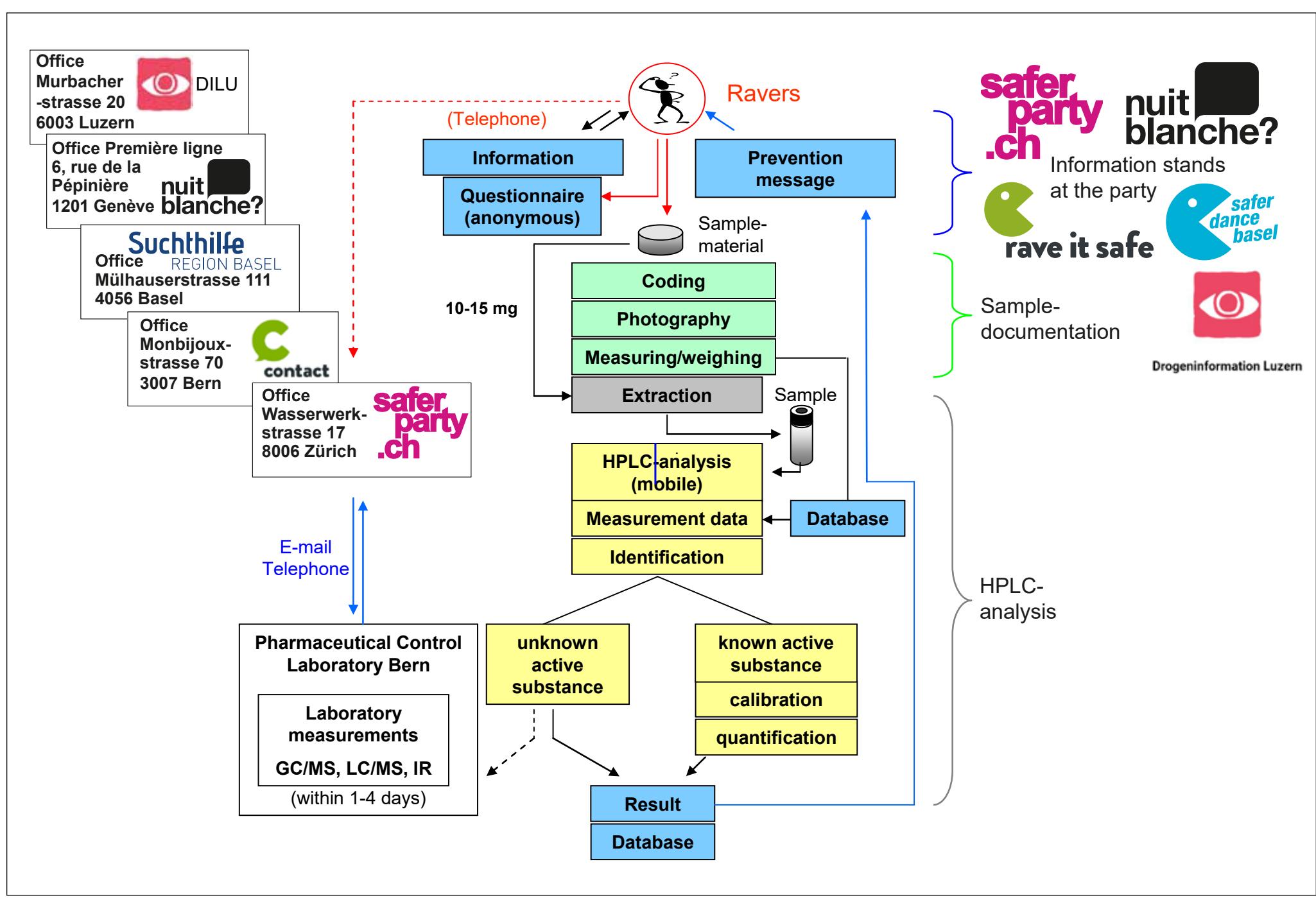
The mobile lab consists of four custom made subunits mounted in steel framed racks on wheels, one for weighing and documentation, one for sample preparation and two with the equipment for chemical analysis (HPLC-DAD).

The lab is operated by two experienced technicians. Before analysis the interested customer is asked by the lab crew to fill out a questionnaire concerning information about the sample; thereafter every sample is digitally documented and characterized by physical appearance (form, weight, dimensions etc.).



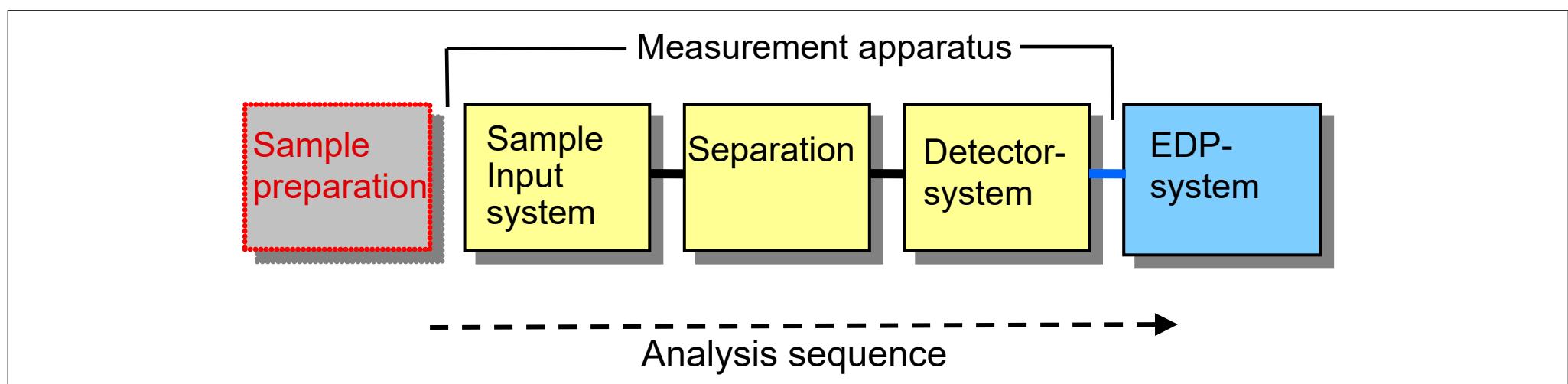
Flow diagram

Collaboration between the prevention-teams and the laboratory



Chemical analysis requirements

Chemical analysis of "Party Drugs" gives one of three possible results. The findings may be a single active agent, several active agents, or indeed no active agent. Reliable analysis of the substances in a sample cannot be achieved by means of a simple "quick test" and is only possible by the use of a complex measurement chain, as shown in the following basic diagram:



This arrangement applies to most modern chemical-analysis measurement systems.

Sample preparation:

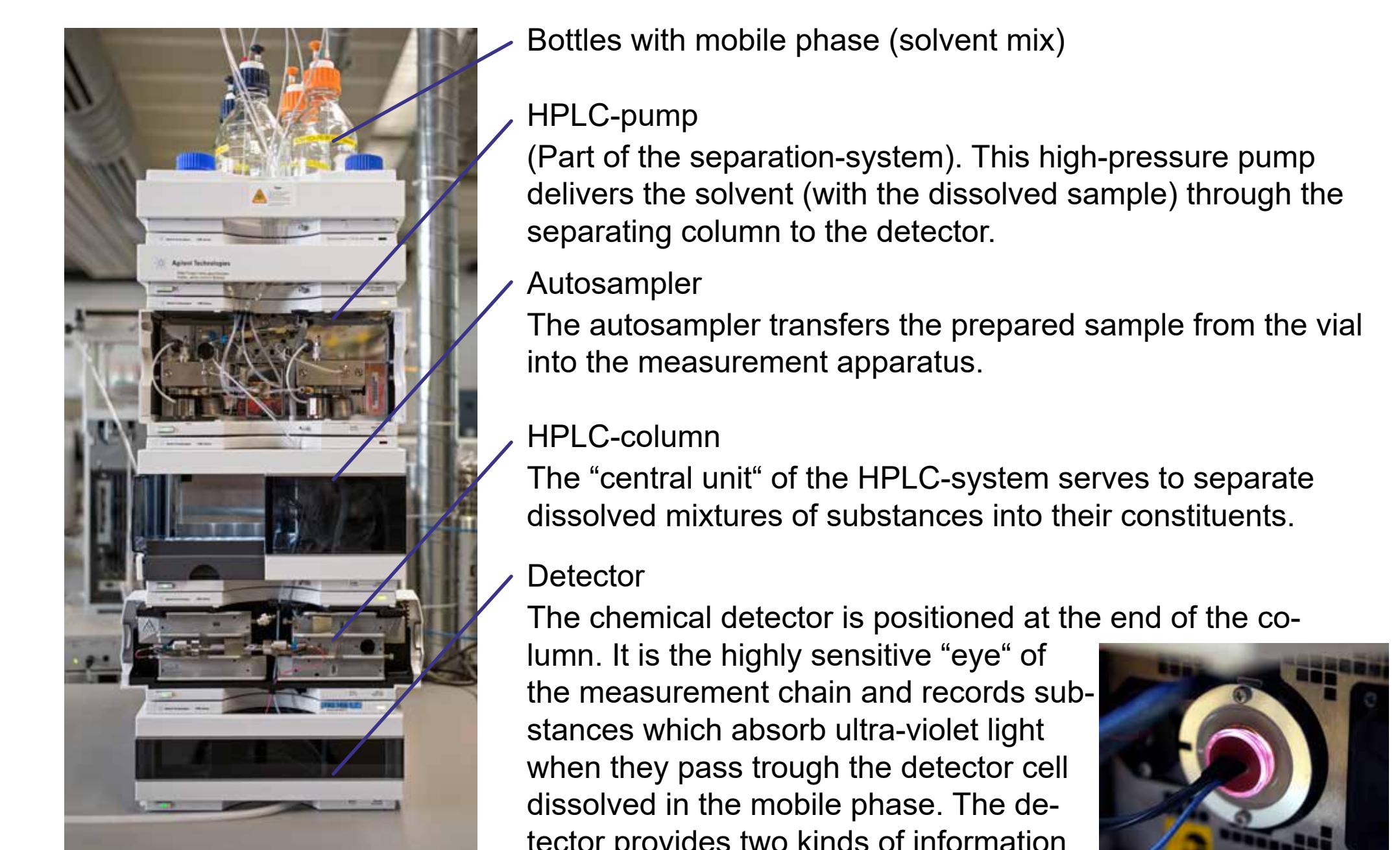
Due to the very sensitive analytical methods, only a representative part of the sample is used for further analysis. Sample preparation is quick and effective. The material is pulverised in a mortar and dissolved in methanol with the aid of an ultrasonic extractor.



An internal standard is added as control. In most cases this extract still contains insoluble components, which must be filtered off before analysis. The clear sample solution obtained is transferred into a sample vial.

HPLC (measurement apparatus)

For chemical analysis of party drugs separation and detection of different constituents of mixtures (active ingredients and fillers) is necessary. With the mobile lab we are using High Performance Liquid Chromatography (HPLC) for the separation process. Our computer controlled HPLC-systems are equipped with DAD/UV-Vis spectrometers (Diode Array Detector).



about the molecules measured: their identity and their quantity. The whole process is continuously monitored with a computer system. Measurement signals are converted into graphical displays appearing on the computer screen. The two most important displays are the chromatogram and the UV-spectrum. The chromatogram is a representation of the separation process. The UV-spectrum is a characteristic constant for a particular substance.

Analytical method (new version, introduced June 2019)

HPLC-System		Gradient program	
Autosampler:	HP-1100, Typ G1313A	Time in min	% A % B
Pump:	HP-1100, Binary Pump, Typ G1312A	0.00 – 0.10	95 5
Detector:	HP-1100, UV-Vis DAD-Detector, Typ G1315B	0.10 – 6.00	95 – 44 5 – 56
Instrument control & integration:	ChemStation for LC 3D software	6.00 – 9.00	44 56
HPLC-Conditions:	Spherisorb 80-3 ODS-1 (Waters)	9.00 – 9.33	44 – 95 56 – 5
Stationary phase:		9.33 – 12.00	95 5
Column dimension:	125 x 4 mm		
Hold-up volume:	1.002 ml		
Elutiontype:	Gradient		
Eluent A	8,50 g ortho-phosphoric acid 85% + 560 µl hexylamine + purified water ad 1000 ml	Flow rate:	1.5 ml/min
Eluent B	4,25 g ortho-phosphoric acid 85% + 280 µl hexylamine + 45,75 g purified water + 351 g acetonitrile	Pressure:	190 bar
		Injection volume:	2.0 µl
		Column temperature:	40 °C
		Detection:	UV 198 nm
		Signal-Range:	190-450 nm

Measuring parameters:

- Flow rate: 1.5 ml/min
- Pressure: 190 bar
- Injection volume: 2.0 µl
- Column temperature: 40 °C
- Detection: UV 198 nm
- Signal-Range: 190-450 nm

Report

Analytical results are available within about 12 minutes. The computer prints the results of the analysis as a report. The report consists of 3 parts: The header, the chromatogram, and the results (including identification and quantification)

Header:

The header contains details like: File-name, sample-number, date of analysis, name of method etc.

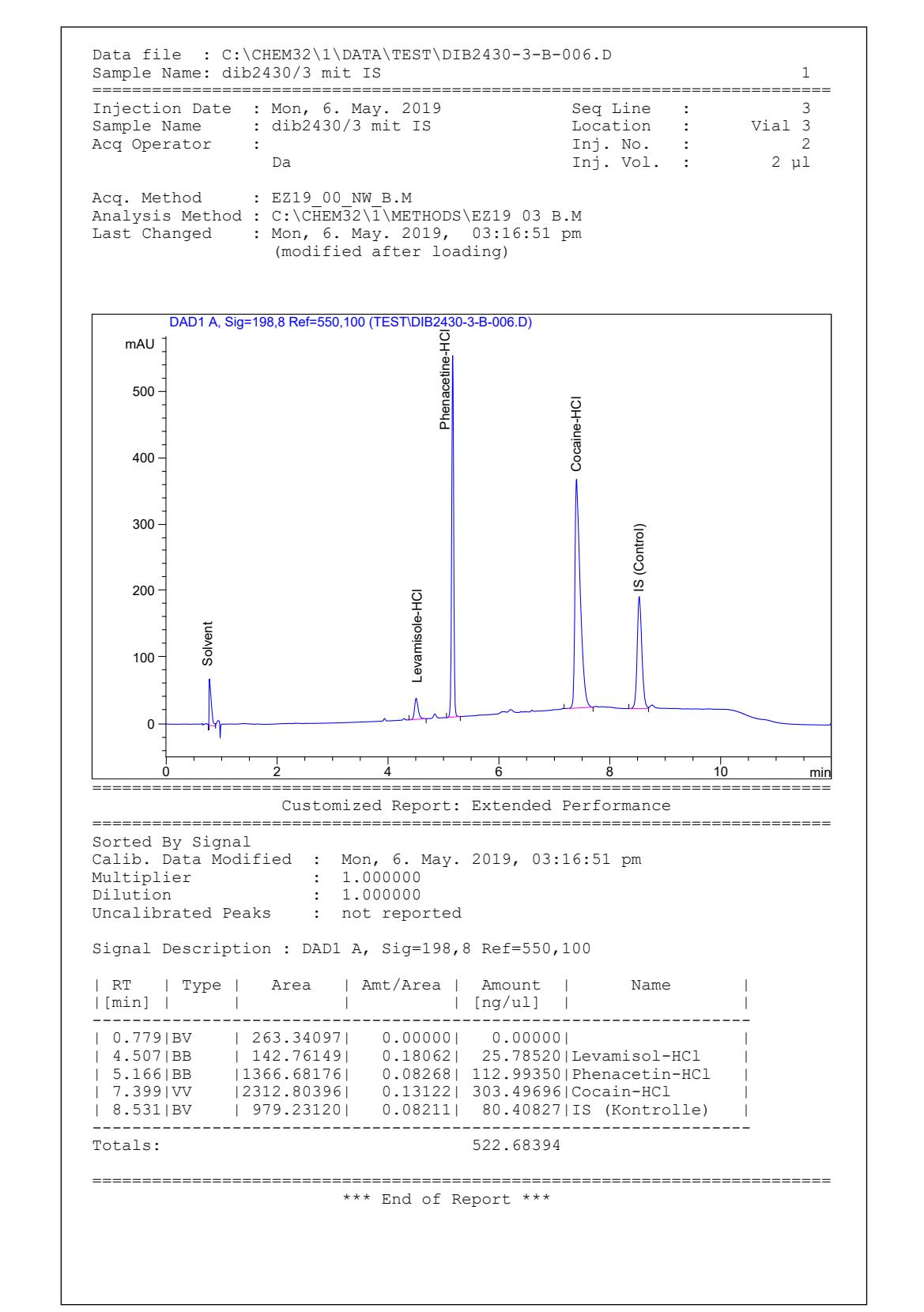
Chromatogram:

The chromatogram is a graphic visualisation of the separation process. Detected substances appear as "peaks".

Results (identification and quantification):

The system compares the area-value of an integrated peak with the corresponding calibration of the active substance in the specified methods. This automatic process gives us a precise quantification.

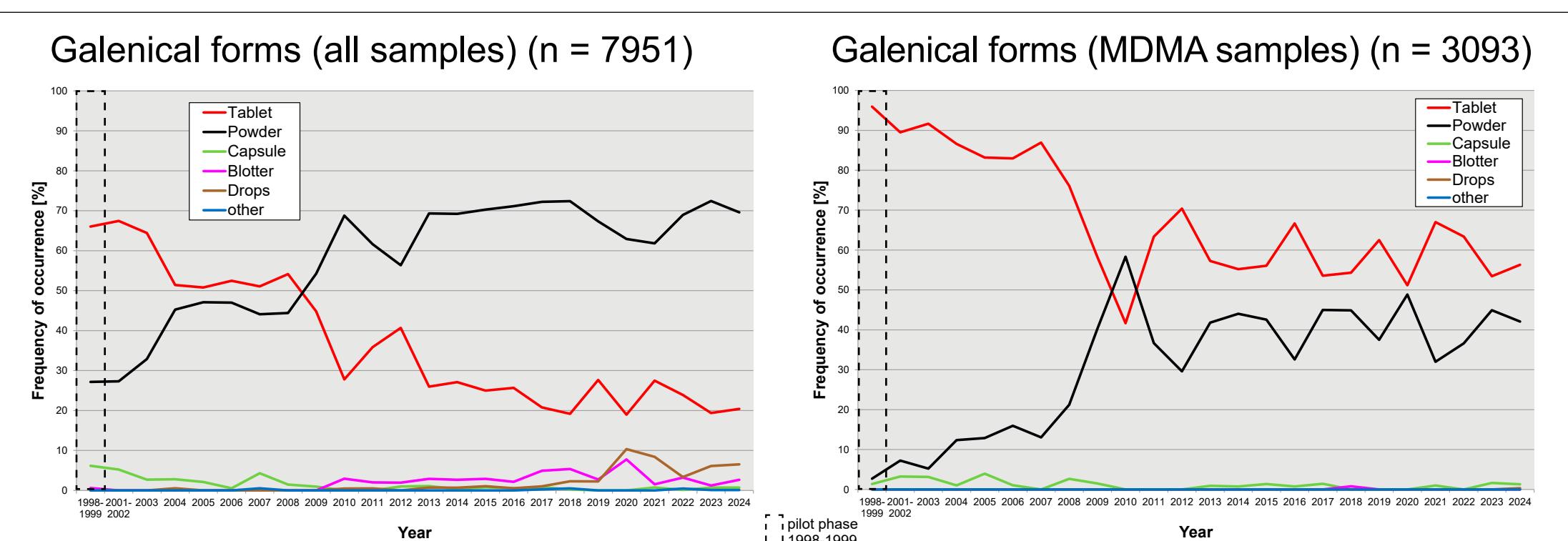
Additionally it is possible to get the UV-spectra of the "peak" and compare it with our specific UV-spectra-library.



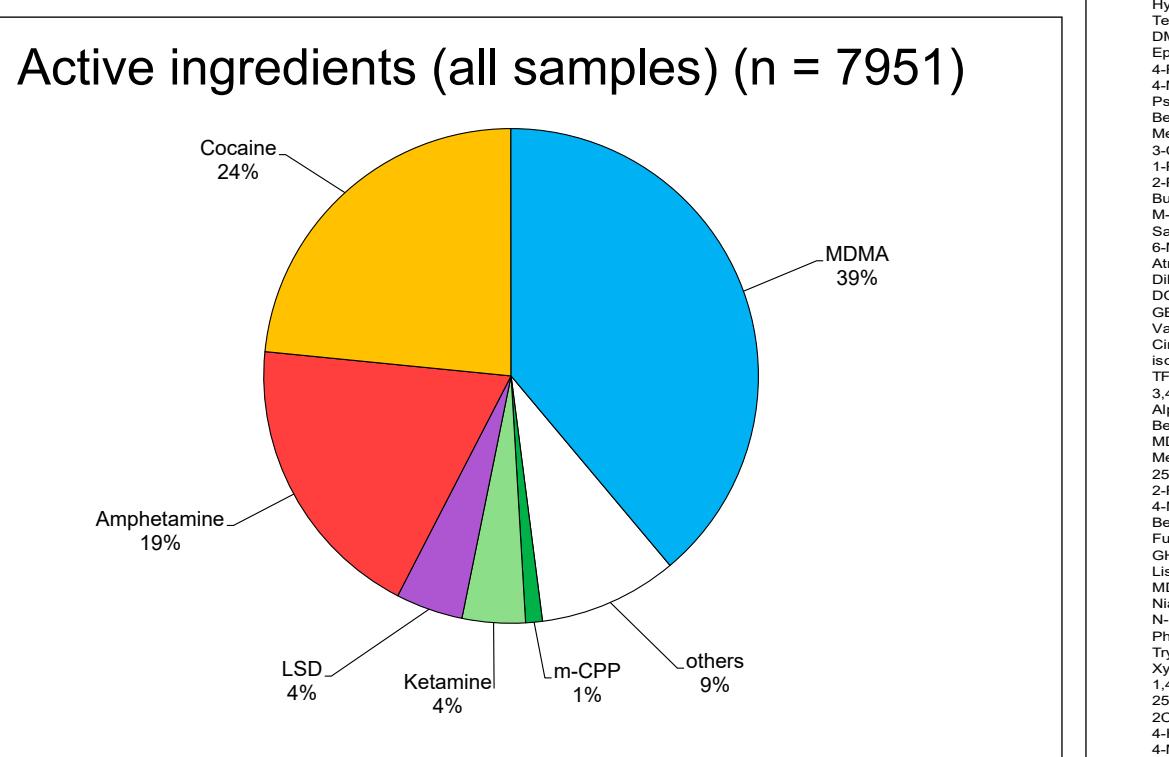
Update: 31.12.2024

Results

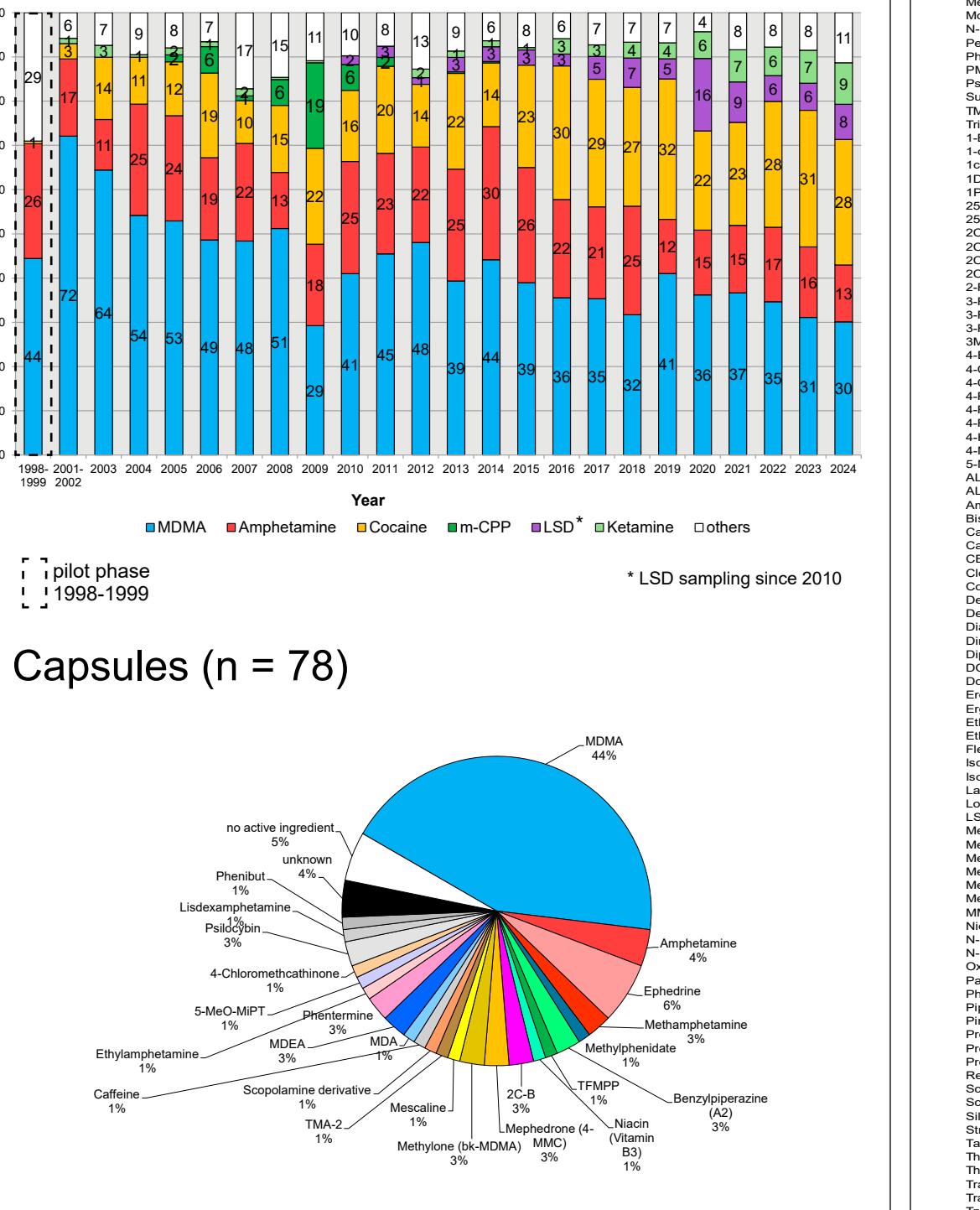
Frequency of occurrence



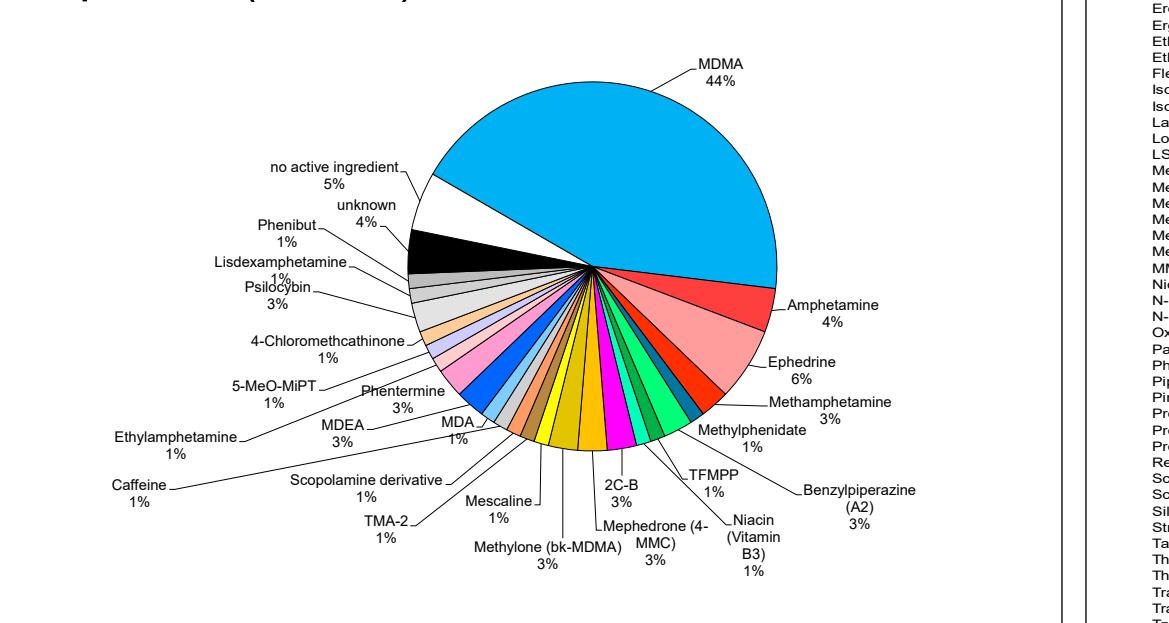
Qualitative results



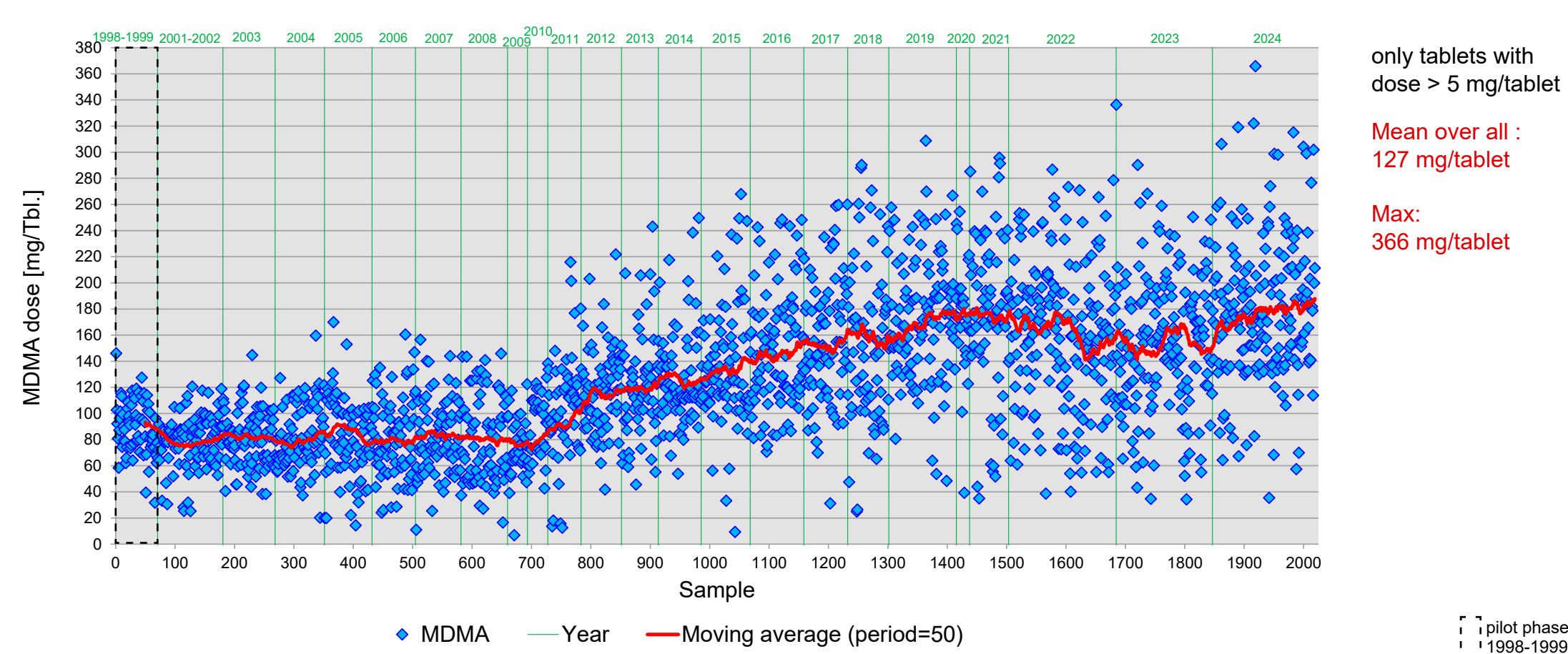
Active ingredients (evolution time based)



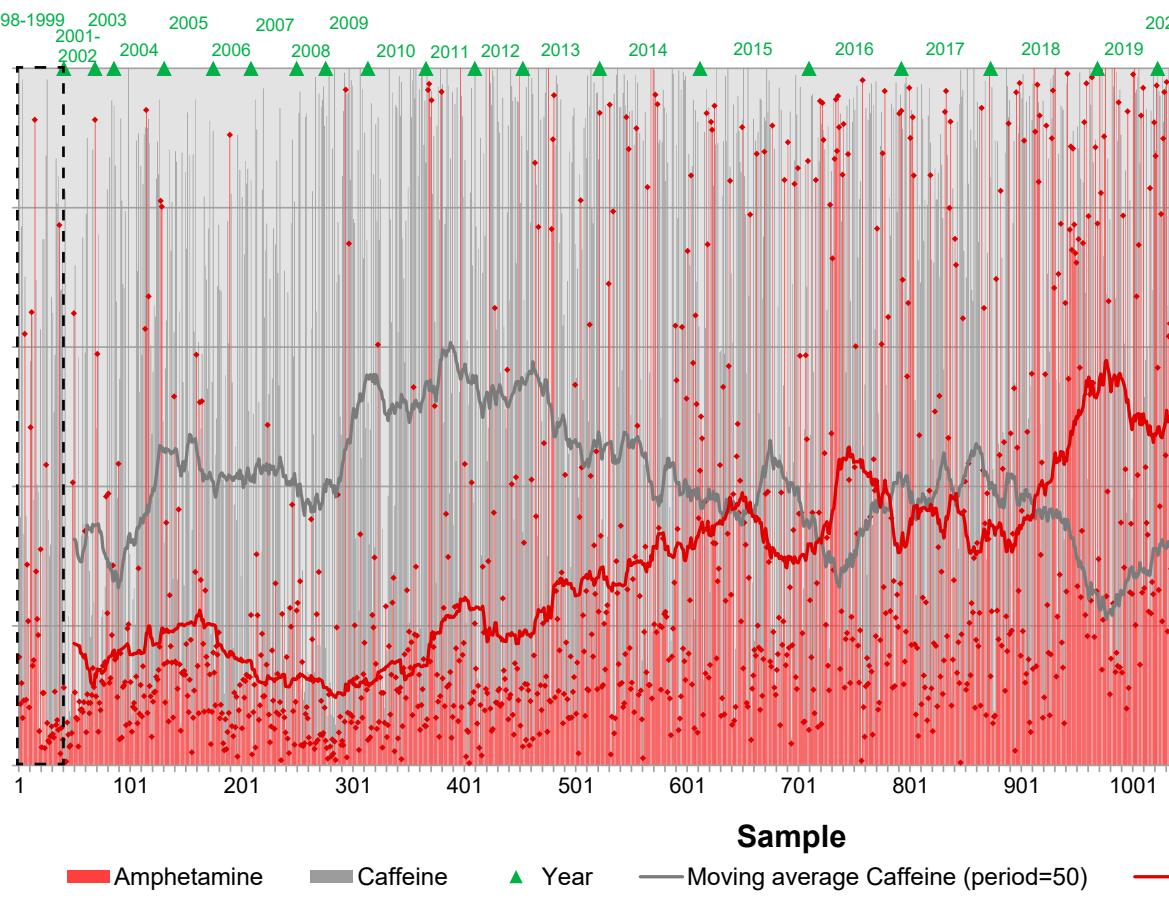
Capsules (n = 78)



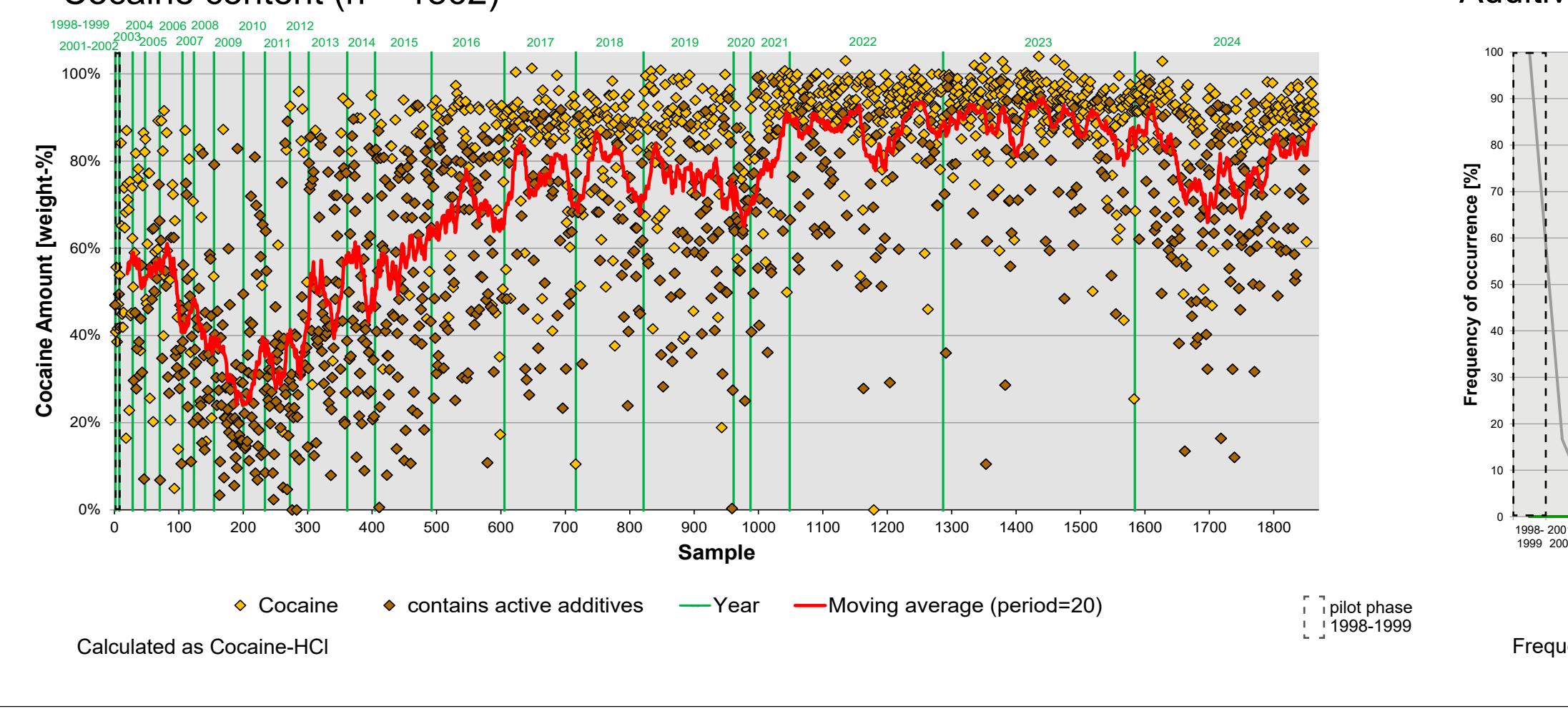
Variation of MDMA-dose in tablets (n = 2019)



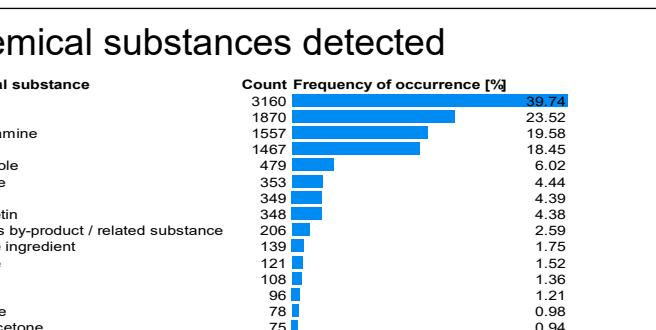
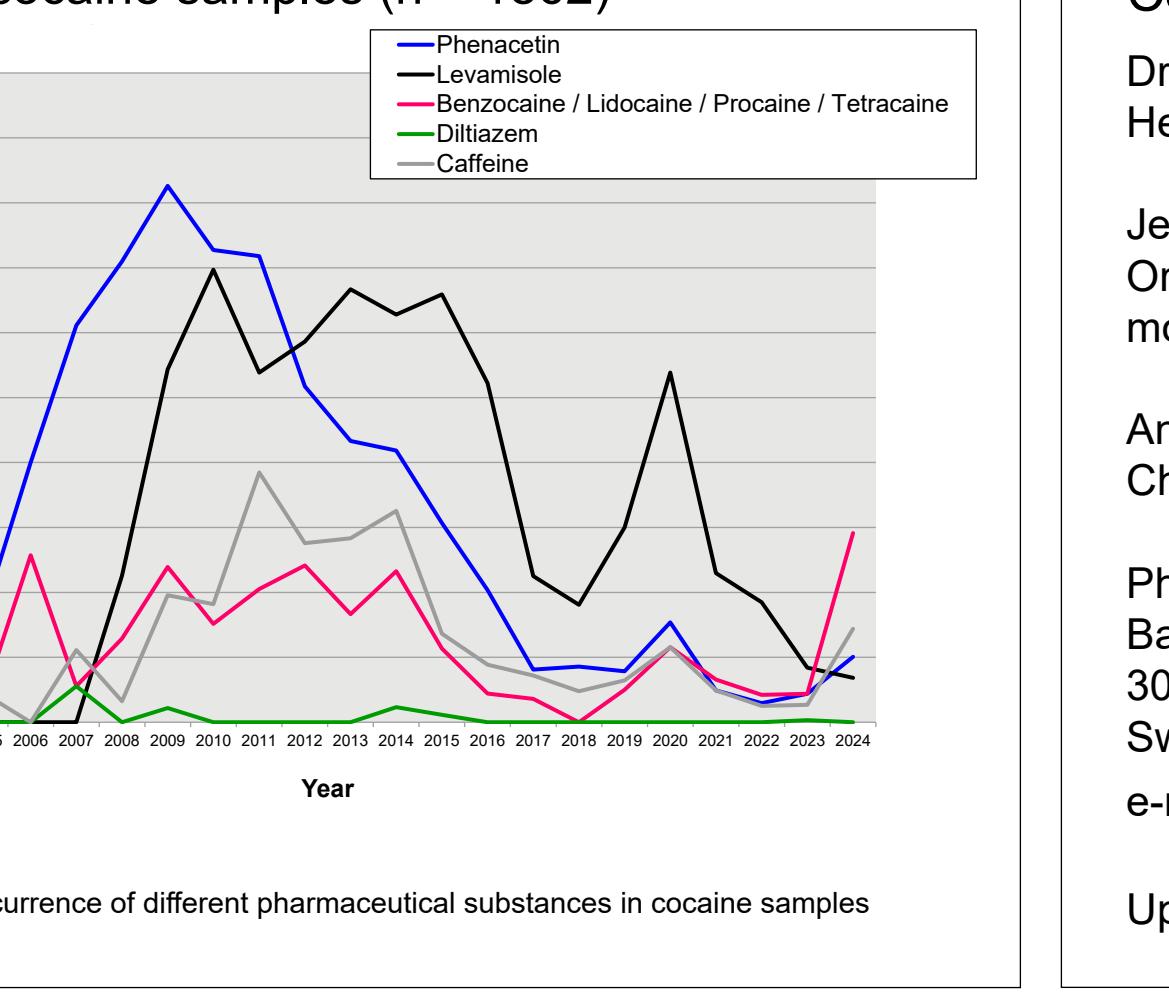
Variation of amphetamine and caffeine amount in powders (n = 1491)



Cocaine content (n = 1862)



'Additives' in cocaine samples (n = 1862)



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