

Synthetic cannabinoids in prisons – invisibly impregnated paper sheets as a Trojan horse

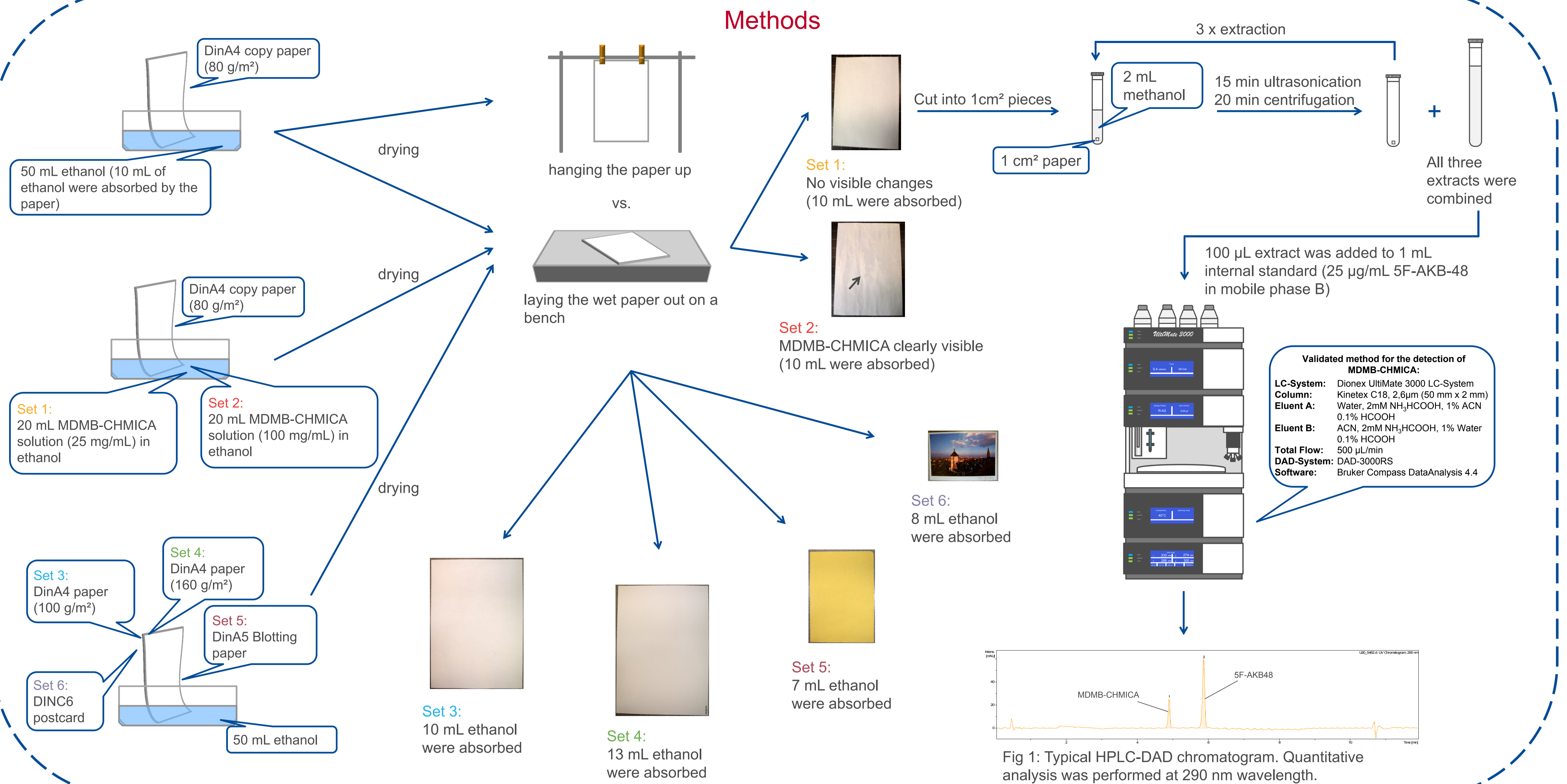
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Background and Objectives

Synthetic cannabinoids (SCs) have been among the most prevalent new psychoactive substances for many years. Due to the non-detectability of most SCs with commercially available rapid test systems SCs are highly prevalent in prisons and in general among people regularly tested for drug abstinence. Often SCs are smuggled into prisons in the form of paper sheets impregnated with SCs (e.g. letters or paintings). The aim of this study was to investigate preparation techniques of soaking paper with SC solutions with a focus on visibility of this manipulation.

Methods



Results

A DIN A4 paper sheet (80 g/cm²) absorbed approximately 10 mL of ethanol and the best drying technique was laying the wet paper out on a bench. Soaking with a **25 mg/mL MDAMB-CHMICA** solution did **not lead to visible changes**. In contrast, soaking with a **100 mg/mL** produced **visible anomalies** on the paper.

In contrast to the 80 g/cm² copy paper used for the quantitation of MDAMB-CHMICA, some other papers were able to absorb up to 27 mL of ethanol (extrapolated quantities to DinA4 paper size). Using a 25 mg/mL MDAMB-CHMICA solution with such papers will therefore lead to much higher concentrations, which might be even more interesting for smuggling into prisons.

Using a postcard as carrier for SCs would be the best for smuggling relatively high amounts of SCs, but the risk of producing visible anomalies on the paper is much higher than with normal white paper.

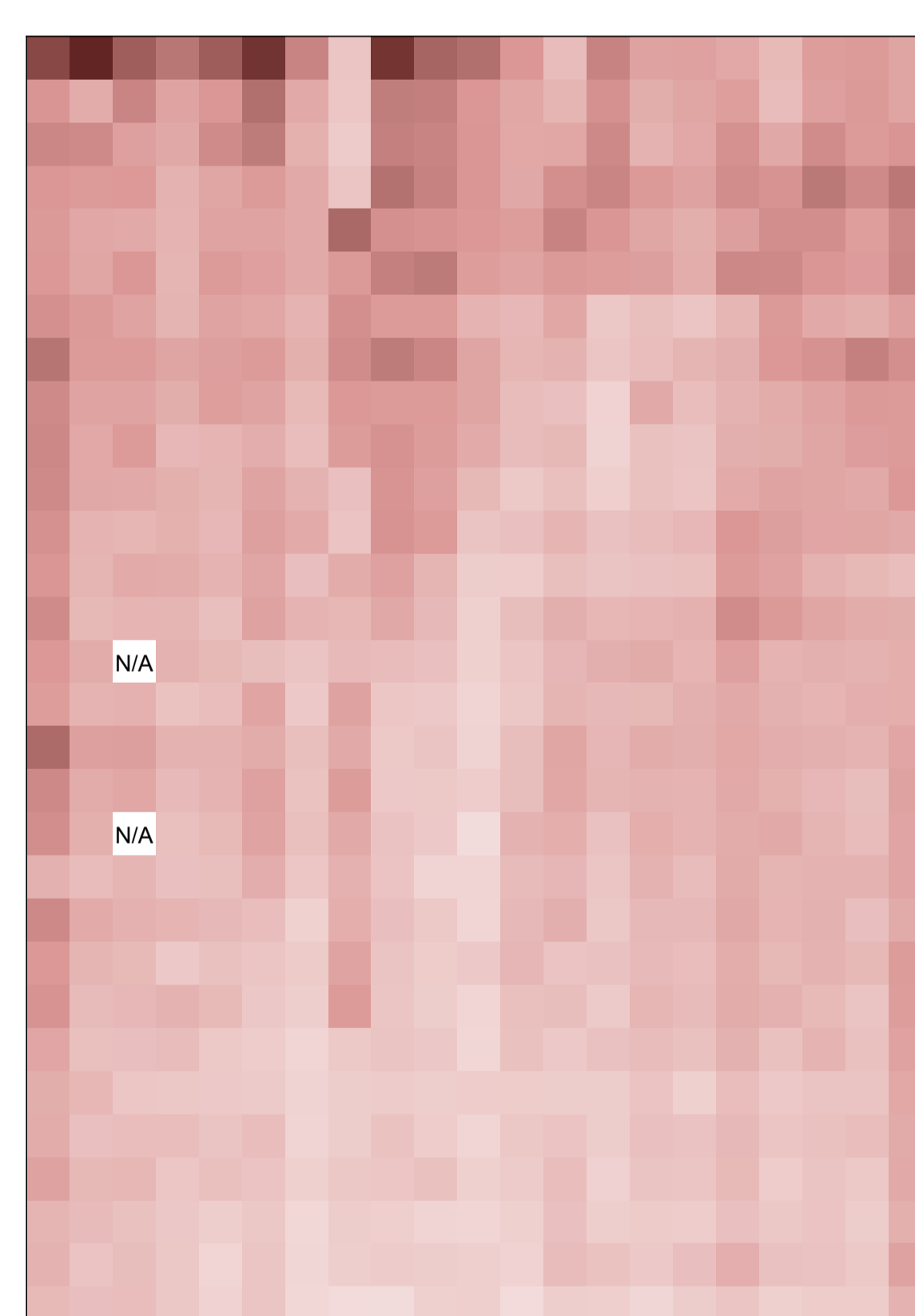


Fig. 2: Heatmap of the quantitative results of the impregnated paper sheet (with MDAMB-CHMICA). The paper was dried by laying it out on a bench. Two samples were destroyed during the quantification process (marked with 'N/A'). Mean concentration: 0.27 mg/cm²; Median 0.26 mg/cm²; Range: 0.16 – 0.52 mg/cm²

The quantitation method was validated according to the guidelines of the German Society of Toxicological and Forensic Chemistry (GTFCh).

Quantitation yielded a **mean concentration of 0.27 mg/cm² ± 22%** (median 0.26 mg/cm², range 0.16 – 0.52 mg/cm²). The highest concentrations were found at the short edge of the paper which first immersed into the solution (Fig 2).

Single doses of MDAMB-CHMICA are estimated to be 0.05 – 0.3 mg [1], and therefore only **one cm² or even less** would be **sufficient to produce an effect**. Assuming that one cm² contains a single dose, **one DinA4 paper sheet** can be divided into **630 consumption units**. The total amount of MDAMB-CHMICA used for one paper sheet was 250 mg in this experiment. MDAMB-CHMICA was bought from an online retailer in 2015, 10 g powder costed £ 57.00 (about 77 €), and therefore the production costs of the impregnated paper sheet in this experiment were about 2 € in total and **less than 1 cent per consumption unit**.

Conclusion

Impregnation of paper sheets with SCs can easily be performed without visible changes using ethanol, a shallow container and a smooth surface for drying. The resulting inhomogeneity of distribution of the SCs across the paper is relatively low with the highest concentrations on the short edge of the paper which first immersed into the solution. Smoking a piece of paper with an area of 0.5 – 1 cm² would lead to a dose comparable to doses proposed for MDAMB-CHMICA in internet fora (0.05 – 0.3 mg). We would strongly recommend to solely **hand out copies** of incoming letters and paintings to avoid smuggling of SCs into prisons.

Acknowledgement:

The authors would like to thank Michaela Schmidt and Svenja Kuczkowski for their help in the laboratory.

References:

[1] European Monitoring Centre for Drugs and Drug Addiction (2016), EMCDDA–Europol Joint Report on a new psychoactive substance: methyl 2-[[1-(cyclohexylmethyl)indole-3-carbonyl]amino]-3,3-dimethylbutanoate (MDAMB-CHMICA), Joint Reports, Publications Office of the European Union, Luxembourg.



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