# New Analytical Approach for Cannabinoid Determination in Urine Samples

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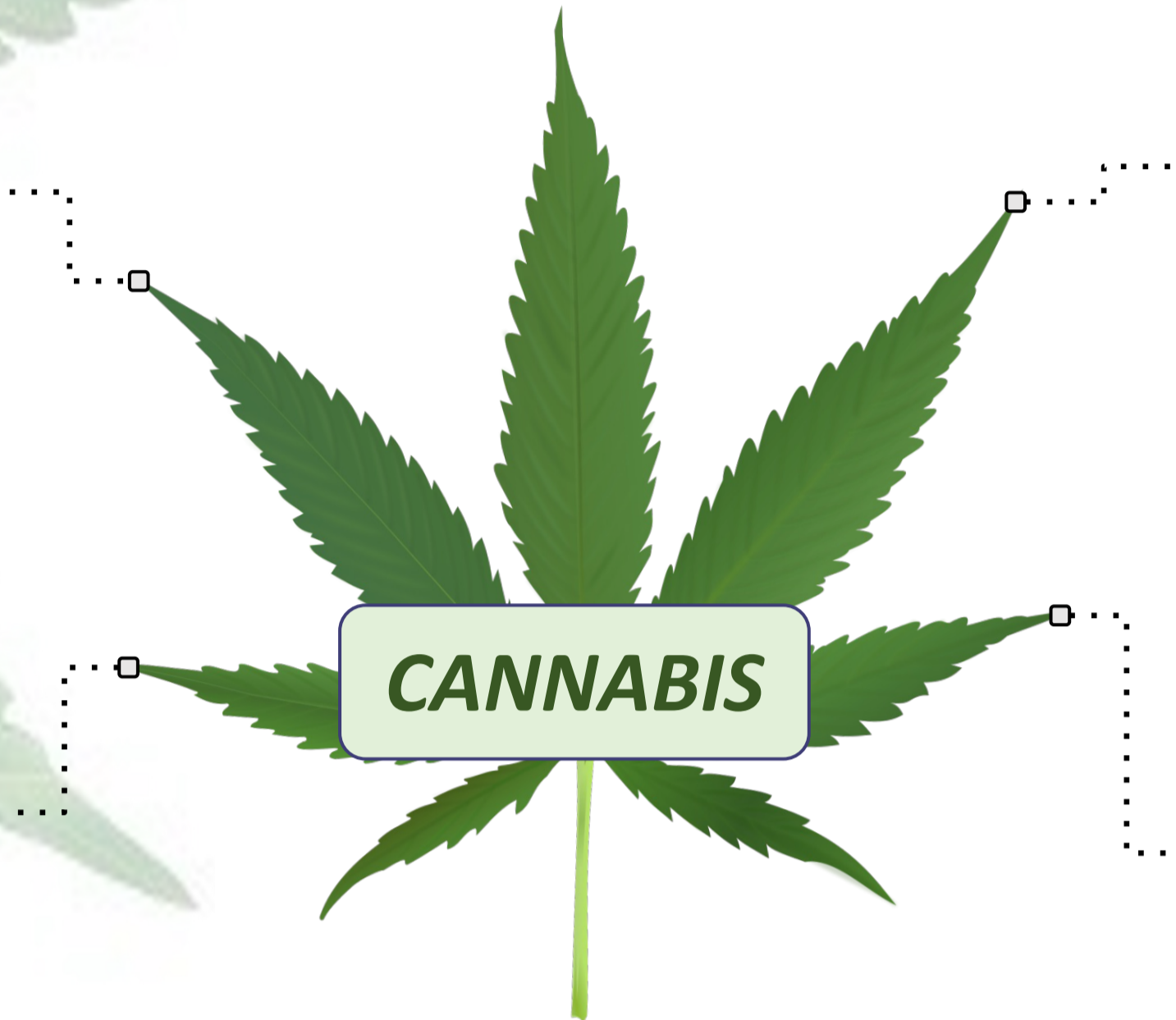
## Mestrado em Tecnologias Laboratoriais em Ciências Forenses – NM & MBP (Estudante) SMA, NRN & AQ (Docente)

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## INTRODUCTION

Therapeutic and Recreational Purposes

Annual Herbaceous Plant

**CANNABIS**

**Highest Consumption Rate**
Over 219 million consumers worldwide in 2021

**Production of Phytocannabinoids**

The main phytocannabinoids in cannabis are $\Delta^9$-tetrahydrocannabinol (**THC**), responsible for psychoactive effects, and **canabidiol** (**CBD**), non-psychoactive compound with therapeutic properties.

The aim of this work is to develop and optimise a **new analytical** and **user-friendly** approach for the **determination of four cannabinoids** (11-hydroxy-THC, 7-hydroxy-CBD, 7-carboxy-CBD and 11-nor-9-carboxy-THC) in **urine samples** through bar adsoptive microextraction followed by gas chromatography-mass spectrometry analysis (**BAµE/GC-MS**).
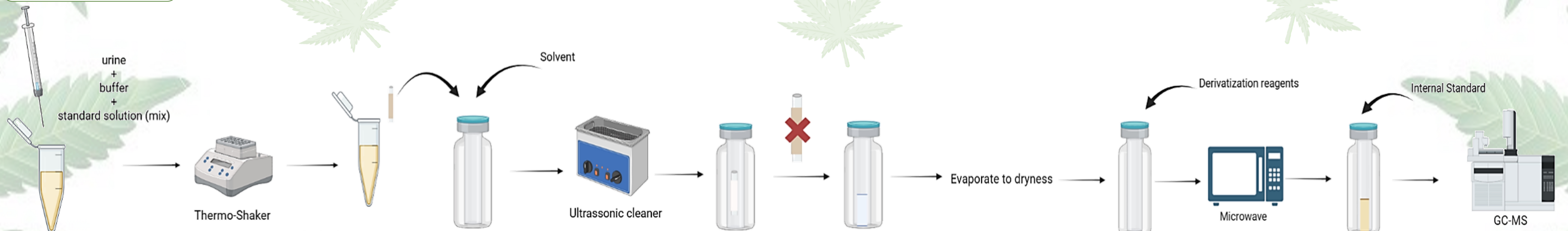
## METHOD



**Figure 1 –** BAµE-µLD/GC-MS(SIM) experimental procedure.
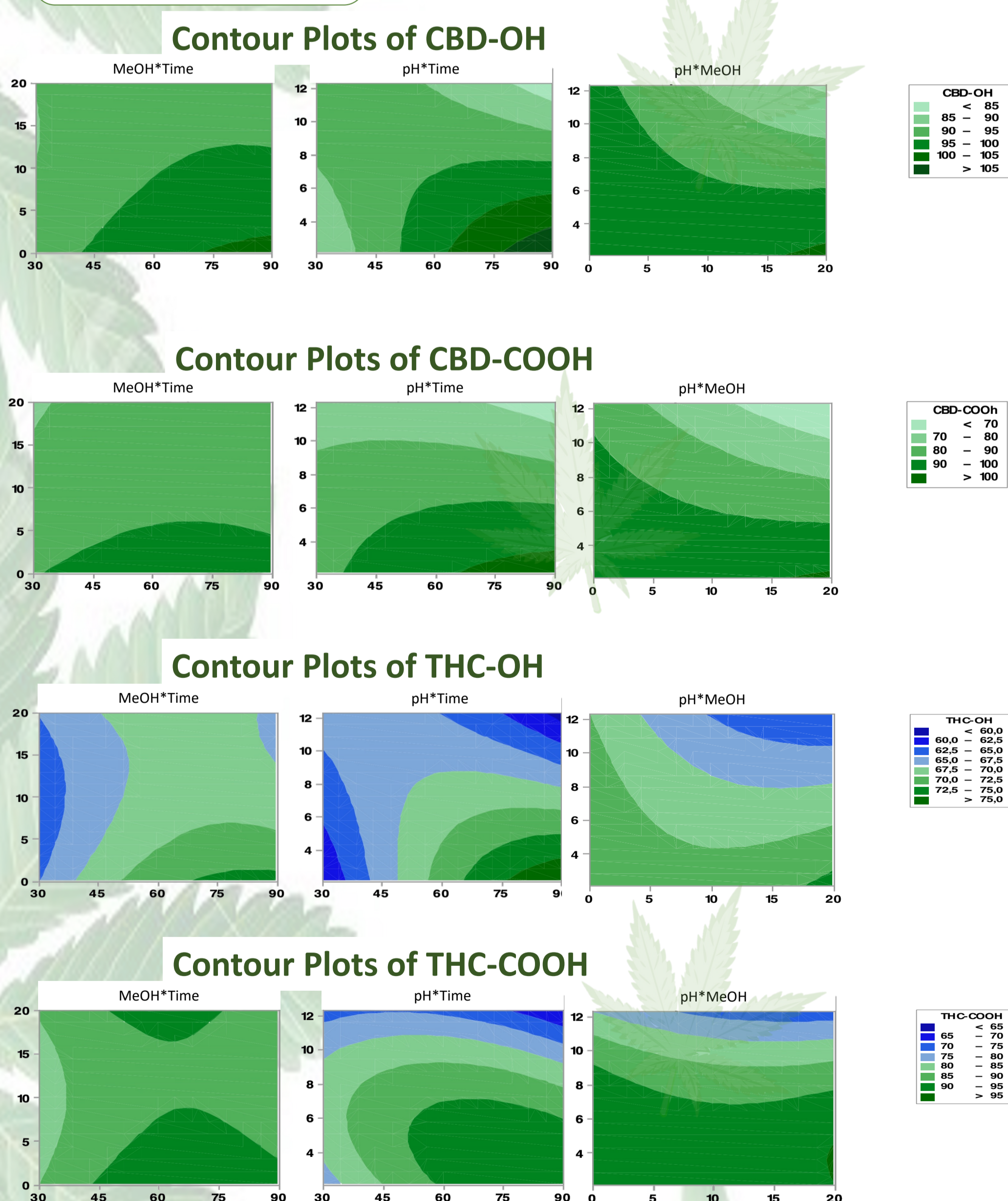
## RESULTS



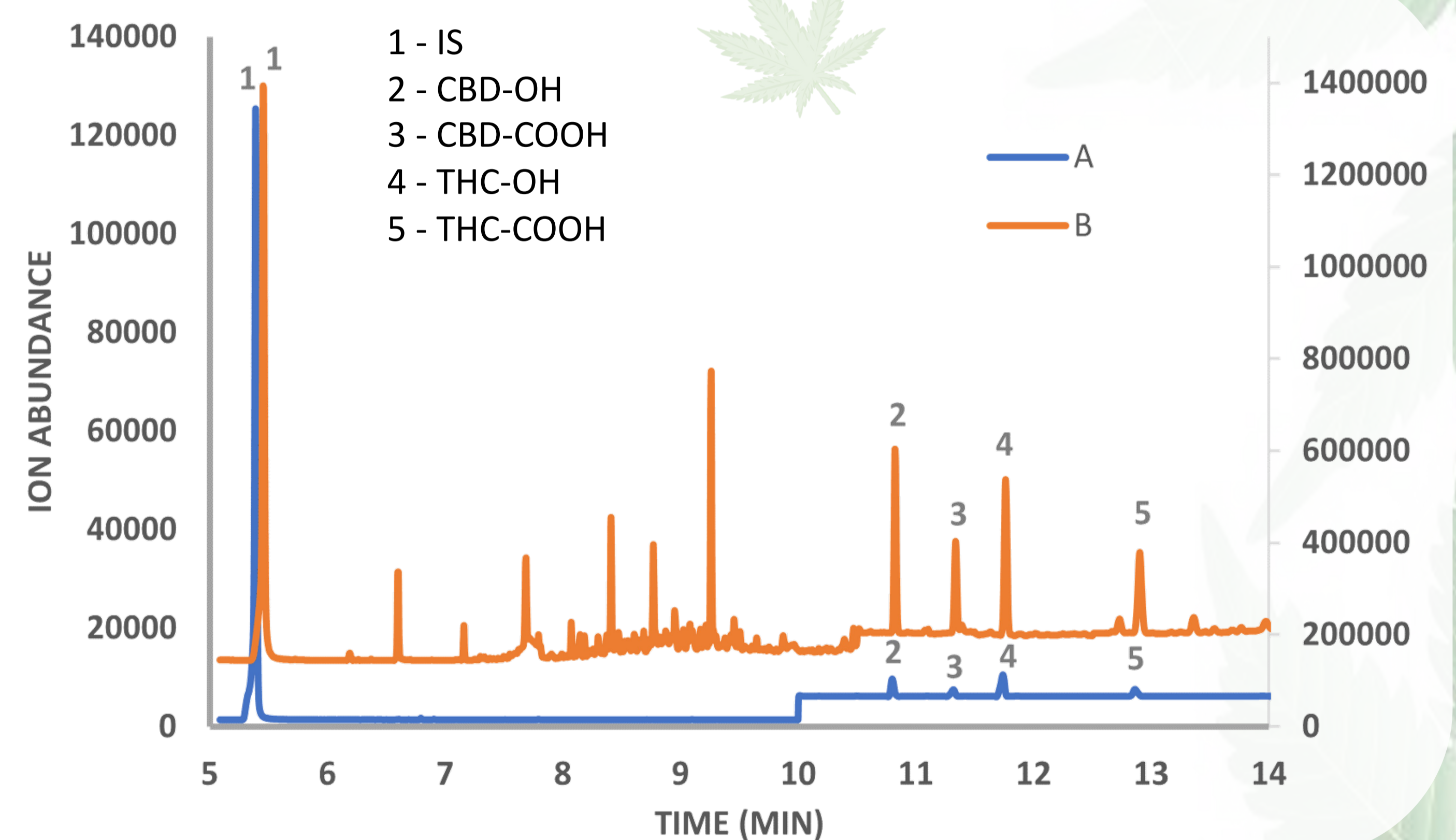**Figure 2 –** Contour plots of extraction stage optimization using Box-Behnken experimental design.

**Figure 3 –** Chromatograms of four standards (A) and after BAµE-µLD (B) with GC-MS(SIM) analysis under optimized conditions.

## CONCLUSIONS

🌿 BAµE/GC-MS(SIM) methodology attained noticeable analytical performance, under optimized conditions, with **recovery yield between 80% - 110%.**

🌿 The instrumental set-up showed **high selectivity** with **short analysis time** (<15 min).

🌿 BAµE/GC-MS(SIM) methodology showed to be a **remarkable alternative**, since it is **cost-effective**, **user-** and **eco-friendly**, requiring **low volume of urine sample**.

## REFERENCES

[1] United Nations Office on Drugs and Crime (UNODC). (2023). World Drug Report 2023, 1-70.

[2] Ide AH, Nogueira JMF. (2018). New-generation bar adsorptive microextraction (BAµE) devices for a better eco-user-friendly analytical approach – Application for the determination of antidepressant pharmaceuticals in biological fluids. J Pharm Biomed Anal., 153, 126–134.

## ACKNOWLEDGMENTS