

The Extraction and Analysis of Cannabinoids using a New Simple Platform

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Introduction

Accurate methods for determination of cannabinoids in cannabis plant material and products is needed because it defines the legality on both the federal and state level.

The EDGE automated extraction system with the miniLC HPLC-UV system is an excellent option for cannabis laboratories seeking a simple solution for cannabinoid analysis.

Methods

1. Duplicate samples of 0.5 g hemp flower were spiked with 100 ug/mL of CBD and CBDA and extracted on the EDGE, using the S1 Q-Disc and the EDGE Method for extracting cannabinoids from cannabis.
2. The extracts were left to winterize in a -20 °C freezer for 12 hours.
3. An aliquot of each extract was diluted five-fold and injected on the miniLC on a Restek Raptor ARC-18 column (2.7 micron, 100 x 4.6 mm).
4. For comparison, a validated hand method was also used. In that method, 0.5 g samples in duplicate were sonicated for 20 minutes in methanol, filtered with a 0.45-micron syringe filter, and winterized overnight at -20 °C. They were similarly diluted and analyzed.

Results

Cannabinoid	Average EDGE AUC (n=2)	Average Hand AUC (n=2)	Recovery (%)
CBDA	4293.08	4358.45	98.50
CBD	4153.53	4092.95	101.48

Conclusions

The EDGE efficiently extracted the CBD and CBDA content from hemp flower, and the miniLC, was used to accurately measure the CBD and CBDA content in the resulting extracts. Together, the EDGE and the miniLC provide a total solution for extracting cannabinoids from cannabis.





The EDGE and the miniLC provide a total solution for extracting cannabinoids from cannabis.




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Figure 1. EDGE Extraction Process



Figure 2. miniLC Method for Cannabinoids



Figure 3. Isocratic flow at 1.5 mL/min of 25% water with 5mM ammonium formate and 0.1% formic acid and 75% acetonitrile with 0.1% formic acid



Figure 4. CBDA & CBD Chromatogram



Figure 5. Cannabinoids Standards Chromatogram

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Poster Content

Introduction

With the continued growth of the cannabis industry and the further progression of the legislation around it, accurate methods for the determination of the cannabinoids in cannabis plant material and products are increasingly needed. The cannabinoid content in cannabis and its products is of interest because it defines the legality of the material on both the federal and state level. The EDGE, an automated extraction system, was utilized to extract cannabinoids from hemp material. The EDGE's extractions produced excellent recoveries for the typical cannabinoids measured in less than 10 minutes in one simple automated process. The EDGE's extract was analyzed using the Lucidity miniLC, a new HPLC-UV system. Good recoveries were achieved in a rapid and simple automated extraction. Good separation of the cannabinoids for accurate analysis was also achieved on the small and easy-to-use miniLC. Thus, the EDGE with the miniLC is an excellent option for cannabis laboratories seeking a simple solution for cannabinoid analysis.

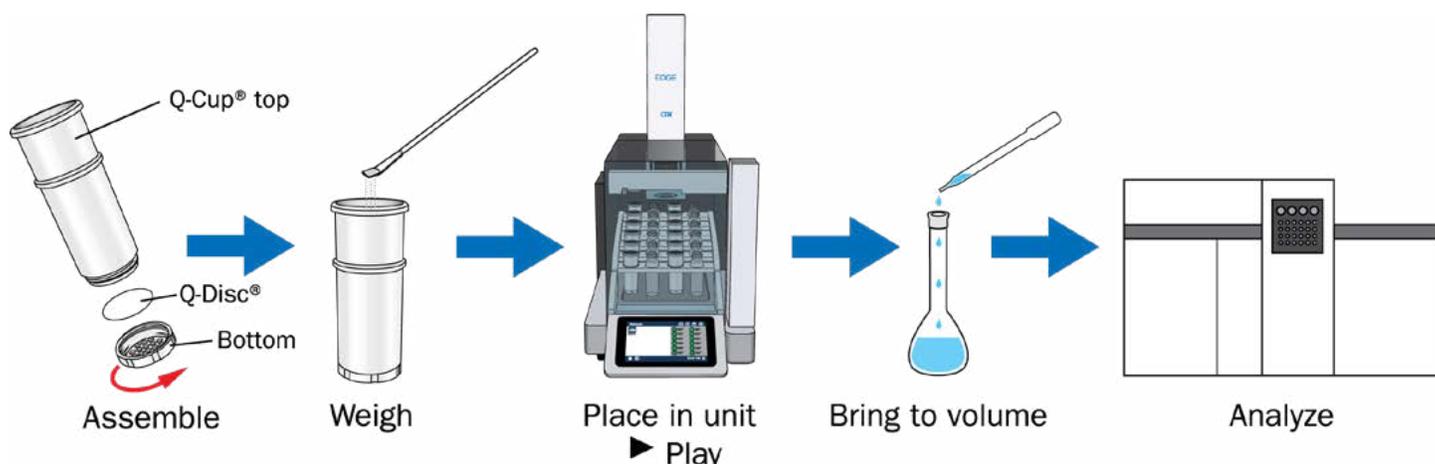


Figure 1. The EDGE Extraction Process

Methods

Duplicate samples of 0.5 g hemp flower were spiked with 100 ug/mL of CBD and CBDA and extracted on the EDGE (as seen in **Figure 1**), using the S1 Q-Disc and the method below. The extracts were left to winterize in a -20 °C freezer for 12 hours. An aliquot of each extract was diluted five-fold and injected on the miniLC on a Restek Raptor ARC-18 column (2.7 micron, 100 x 4.6 mm). The method used on the miniLC can be seen in **Figure 2** (page 3) with isocratic flow at 1.5 mL/min of 25% water with 5mM ammonium formate and 0.1% formic acid and 75% acetonitrile with 0.1% formic acid. A representative chromatogram showing separation of CBD and CBDA can be seen in **Figure 3** (page 3). For comparison, a validated hand method was also used. In that method, 0.5 g samples in duplicate were sonicated for 20 minutes in methanol, filtered with a 0.45-micron syringe filter, and winterized overnight at -20 °C. They were similarly diluted and analyzed. The hand method was regarded at 100% recovery, and the EDGE results were compared to them to establish recovery results (shown in **Table 1**).

EDGE Method for Extraction of Cannabinoids from Hemp Flower

Q-Disc: S1 Q-Disc Stack (a sandwich of three filters including a glass-fiber filter surrounded by two cellulose filters)

Cycle 1

Extraction Solvent: Methanol
Top Add: 15 mL
Bottom Add: 0 mL
Rinse: 5 mL
Temperature: 45 °C
Hold Time: 05:00 (mm:ss)

Wash 1

Wash Solvent: Isopropanol
Wash Volume: 20 mL
Temperature: 80 °C
Hold time: 00:05 (mm:ss)

Wash 2

Wash Solvent: Methanol
Wash Volume: 10 mL
Temperature: None
Hold Time: 0:00 (mm:ss)

Results

Cannabinoid	Average AUC (n=2)	Average Hand AUC (n=2)	Recovery (%)
CBDA	4293.08	4358.45	98.50
CBD	4153.53	4092.95	104.48

Table 1. Recovery Results for EDGE versus Hand Method

Conclusions

Cannabis plant materials are complex matrices and are challenging to extract. The EDGE efficiently extracted the CBD and CBDA content from hemp flower, and the new HPLC-UV system developed by Lucidity, the miniLC, was used to accurately measure the CBD and CBDA content in the resulting extracts. Together, the EDGE and the miniLC provide a total solution for extracting cannabinoids from cannabis.

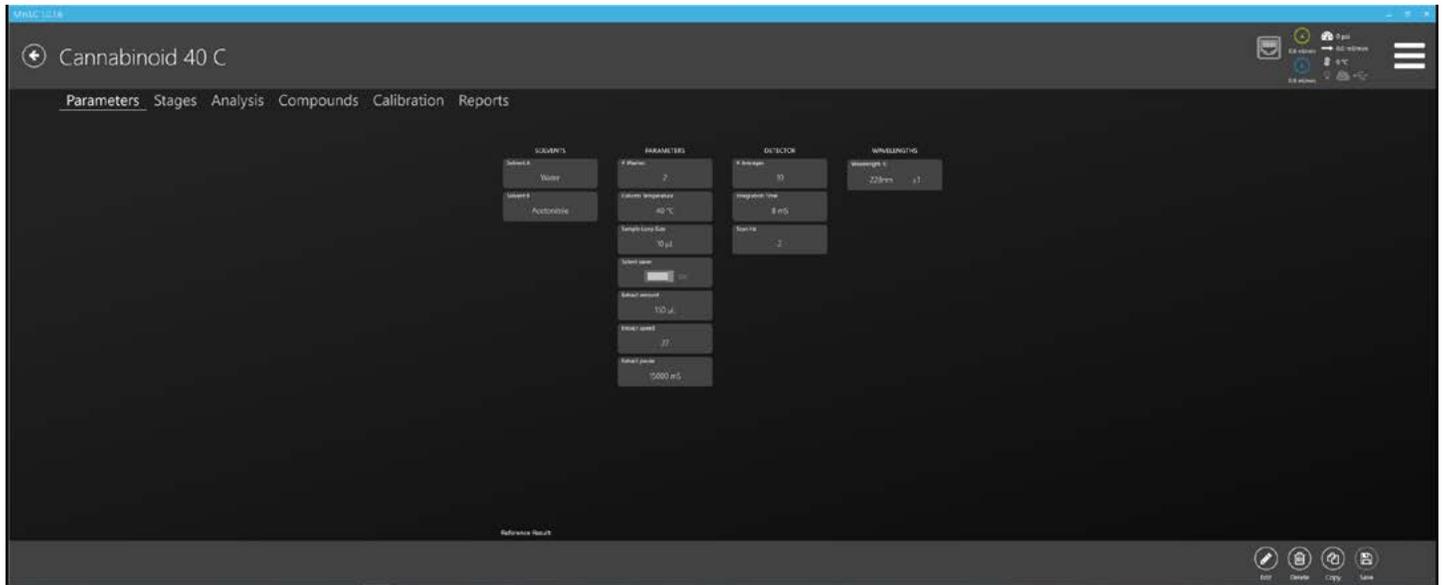


Figure 2. miniLC Method for Cannabinoids



Figure 3. Chromatogram Showing Separation of CBD and CBDA

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