Rapid Sample Extraction for Analysis of Cannabinoids, Pesticides, Mycotoxins and Terpenes in Cannabis

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Introduction

Due to the complex nature of the cannabis plant and products, a complete and reliable analysis of the compound classes of interest, from both a safety and quality perspective, can be difficult to achieve. The first step for these types of analyses is to ensure a complete extraction of the desired compounds, including cannabinoids, pesticides, mycotoxins, and terpenes. Herein, a simple process for fast, efficient, and reproducible extraction of the cannabis samples will be presented. Ultimately, this process provides a simple means to determine constituents and contaminants in cannabis and cannabis-containing products for labs worldwide.

Methods

1. Duplicate samples of 1 g of milled hemp were spiked with 200 µL of 1000 ppm mycotoxin standard.
2. The samples were extracted on the EDGE, using the S1 Q-Disc at 35 °C for 3 min with 20 mL of acetonitrile.
3. 2 µL of each extract was injected on a AQUITY Waters UPLC H-Class with XEVO TQD, equipped with a Restek Raptor ARC-18 100 mm x 2.1 mm, 2.7 µm column.
4. Mobile Phase A: 2 mM ammonium formate with 0.1% formic acid in water and Mobile Phase B: 2 mM ammonium formate with 0.1% formic acid in methanol; gradient from 5% to 95% B at a flow of 0.5 mL/min.
5. Analysis by Waters Xevo TQD comparing pre and post spiked samples.

Note: This process was used to extract mycotoxins from hemp. A very similar process was used to extract cannabinoids, pesticides, and terpenes from mixed samples, all on the same system.

Results

Mycotoxin	% Recovery
Aflatoxin B1	90
Aflatoxin B2	100
Aflatoxin G1	88
Aflatoxin G2	80

Conclusion

One simple extraction process can be used to efficiently extract mycotoxins, cannabinoids, pesticides, and terpenes from the cannabis plant and products. Here, a group of mycotoxins extracted from hemp was used as an example. CEM also offers a rapid and efficient solution to determine metals in the cannabis plant and products. Method and data details for the other compounds and metals can be found at cem.com/cannabis.

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Take a picture to access more info on cannabis solutions from CEM.

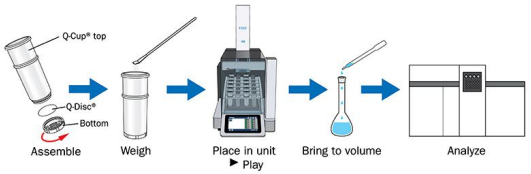

Figure 1. EDGE Extraction Process

Cannabinoid	% Recover (n=2)
CBDA	99
CBD	101

Table 1. Percent Recovery of Cannabinoids from Cannabis Plant*

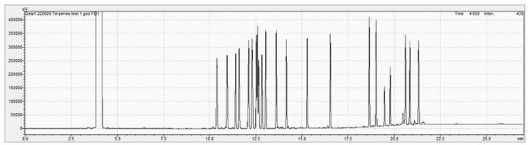

Figure 2. Chromatogram of Terpenes

Pesticide	% Recovery
Abamectin	99
Azoyxystrobin	100
Bifenazate	82
Etoxazole	97
Imazalil	103
Imidacloprid	91
Malathion	117
Myclobutanil	90
Permethrin	95
Spinosad A	106
Spiromesifen	110
Tebuconaxzole	81

Table 2. Percent Recovery of Pesticides from Cannabis Plant*

Fortified Sample	^{75}As (%)
Blank	105
Hard Candy	102
Granola Bar	91
MCT Oil	108
Hemp Oil	105
Lotion	99
Beef Jerky	96
Peanut Butter	104
Hemp Flower	96
Ghee	109
Gummy	95
Concentrated CBD Oil	108

Table 3. Percent Recovery of Metals from Cannabis Products*

*Details and additional data available at cem.com/cannabis

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