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Chromatography Solutions

Flavour Profiling in Cannabis

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As a pharmaceutical drug, Cannabis should be rigorously tested to comply with stringent rules and regulations regarding quality and safety of the product. As there is currently no centralised regulatory body for Cannabis quality control, responsibility for testing falls to the dispenser, manufacturer and even the individual consumer - if they are growing their own for personal medical use.

As Cannabis is now effectively legalised at state level in the United States, but has remained illegal at Federal level, the usual routes for substance regulation cannot be applied. The Food and Drug Association (FDA) is normally at the forefront of ensuring consumer safety, but they are effectively restricted from completing effective drug trials, as the DEA official position means they cannot provide illegal substances for testing. The absence of this data means the FDA are unable to provide relevant regulations, resulting in the FDA declaring Cannabis as not safe for human consumption. However, Delta-THC, the main psychoactive ingredient in the L-Sativa plant has been an FDA approved drug for over 25 years. This has helped influence the general opinion that Cannabis itself should also be an FDA regulated substance.

Cannabis has an abundance of different strains with many different side effects. In order for medicinal Cannabis to be regulated and prescribed correctly to treat specific ailments, strain determination is essential.

Flavour profiling would be applicable for determining strain identity through levels of compounds responsible for distinctive tastes and smells e.g. Terpenes.

Flavour profiles in Cannabis were tested by using a readily available standard to show that the compounds can be clearly and easily detected when using an Ellutia 200 Series Gas Chromatograph.

A liquid sampling technique was used when testing for Terpenes. This is so that all molecules can be equally represented in the injected sample. Headspace would not be recommended for this task, due to larger molecules struggling to reach the gas phase. It is hard to find a headspace temperature where all molecules can be equally sampled when analysing Terpenes. The samples were placed in an EL3000A liquid autosampler. The 200 Gas Chromatograph with an FID (Flame Ionisation Detector) analysis conditions are shown above. The GC and Liquid Autosampler is a cost effective addition to any lab.

GC Conditions	
Injector Temperature:	270^{0}C
Detector Type:	FID
Detector Temperature:	280^{0}C
Carrier Gas Type:	Hydrogen
Stimulated Constant Flow:	2.5 ml/ min^{-1}
Split Flow:	70 ml/ min^{-1}
Column Type:	EL-5 30 m x 0.25 mm x 0.25µm
Temperature Program	
Initial Temperature:	100^{0}C
Ramp 1:	30^{0}C min^{-1} to 200^{0}C (hold for 5 minS)

As shown in figure 1, all components normally found when testing for Terpenes were detected, and detected very clearly.

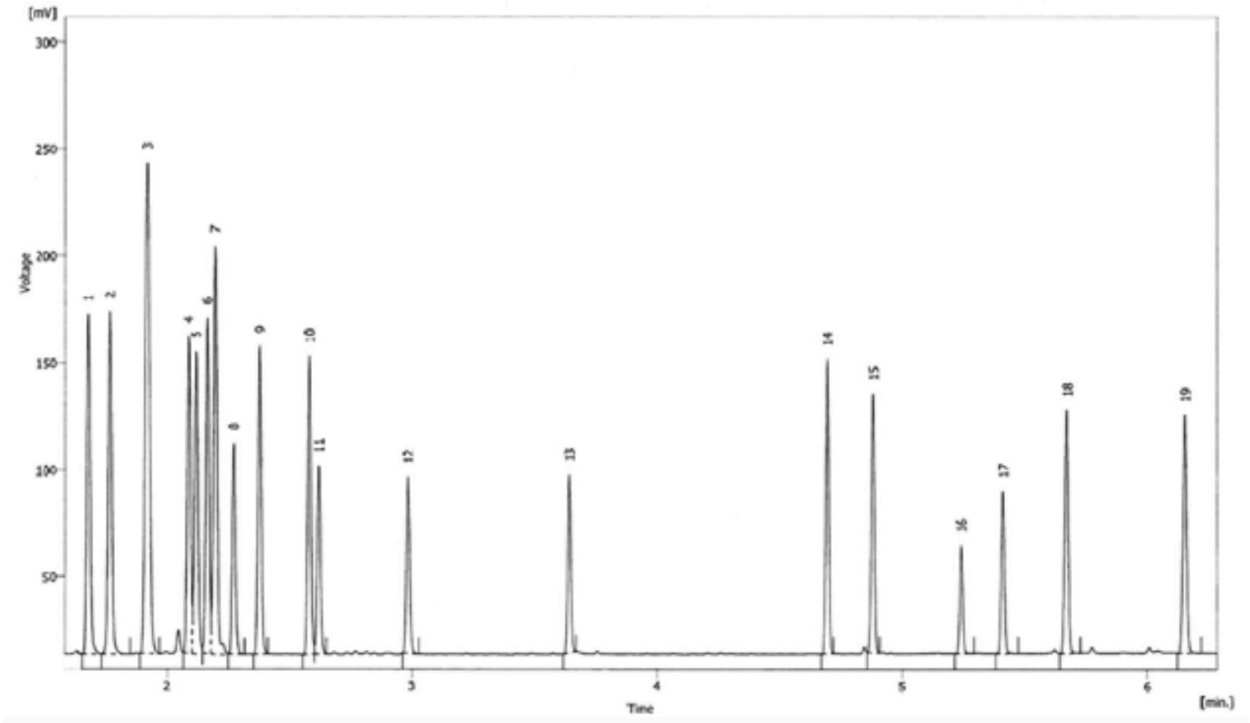

Figure 1 - A 1.0 uL injection of a 625 ppm Terpene mix standard

1. a-Pinene
2. Camphene
3. b-Pinene
4. b-Mycene
5. d3-Carene
6. a-Terpinene
7. p-Cymene
8. d-Limonene
9. Ocimene
10. g-Terpinene
11. Terpinolene
12. Linalool
13. iso-Pulegol
14. Geraniol
15. b-Caryophylene
16. a-Humulene
17. Nerolidol
18. Guaiol
19. a-Bisabool

Ordering Guide

Main Instruments	
Ellutia 200 Series Gas Chromatograph, FID	(Part no. 20500130)
EL 5 30 m x 0.25 mm x 0.25 µm column	(Part no. 51100157)
Colibrick	(Part no. 23001022)
Ellution Software - Single Instrument	(Part no. 23001001)
Liquid Autosampler	
Ellutia EL3100A Automatic Liquid Autosampler - 15 position	(Part no. 30500011)
Ellutia EL3000A Automatic Liquid Sampler - 121 position	(Part no. 30500010)
GC Mounting Kit for EL3100A/EL3000A Autosampler	(Part no. 30500018)
Accessories	
7000 Series Flowmeter	(Part no. 21007000)
5 µl Liquid Syringe	(Part no. 20511202)
2ml Short-cap Screw Thread Vials	(Part no. 20511101)
Pre-assembled Short Blue Screw Vial Closures	(Part no. 20511102)

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To learn more about Ellutia's range of chromatography solutions, please visit:
www.ellutia.com

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