Simultaneous analysis of California cannabis Pesticide Residues list using UCT's Selectra PFPP HPLC column and LC-MS/MS

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INTRODUCTION

Analysis of cannabis potency and pesticide residues has become, over the past few years, one of the most important topics discussed amongst the analytical society. Since it is not federally regulated, many states are resorting to defining and regulating the production and use of cannabis products for both medicinal and recreational capacities.

As of right now, the regulations of testing and monitoring acceptable levels of pesticide residues in cannabis products has been independently developed by each state. For instance, the state of California has released regulatory requirements for 66 pesticides that are predominantly used in cannabis cultivation. One of the main challenges in testing pesticide residues in cannabis is the development of a robust analytical method that is capable of resolving identical isomers of many different analytes in the method. Having this privilege can assist in determining specific contaminants that may pose great health risks to consumers. This poster outlines the simultaneous analysis of the California Cannabis List of Pesticides monitored using **UCT's Selectra PFPP HPLC column**.

METHOD PARAMETERS / GRADIENT

TIME (min)	**MPA :** 10mM Ammonium Formate with 0.1% Formic Acid in D.I Water	**MPB:** Acetonitrile
0.0	98	2
12.0	0	100
13.0	0	100
13.1	98	2
16.5	98	2

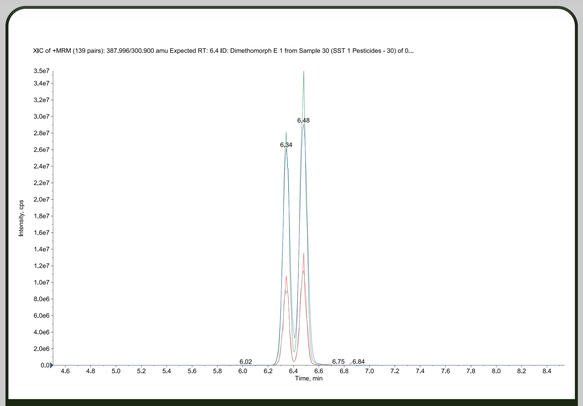

Figure 1: Critical Separation of Dimethomorph Isomers

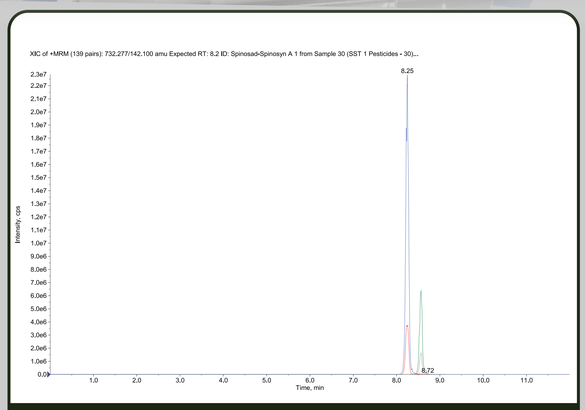

Figure 2: Separation of Critical Isomers - Spinosyn A and D

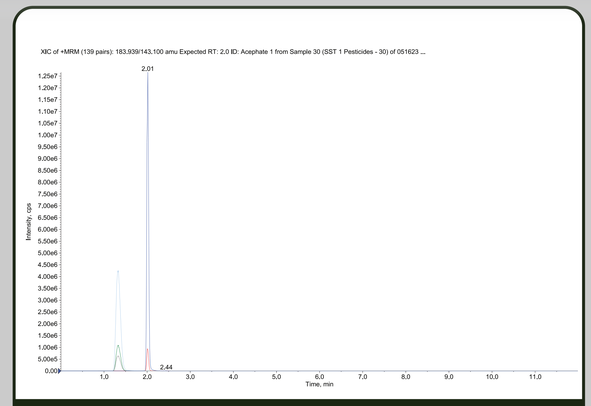

Figure 3: Retention of Early Eluting Analytes - Daminozide and Acephate

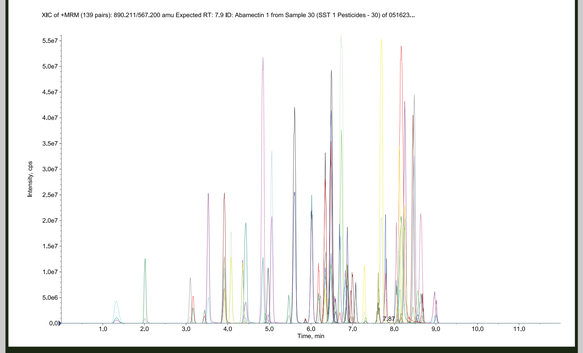

Figure 4: Pesticides Panel TIC

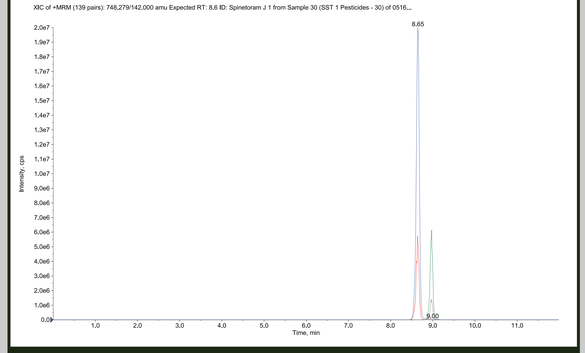

Figure 5: Separation of Critical Isomers - Spinetoram J and L

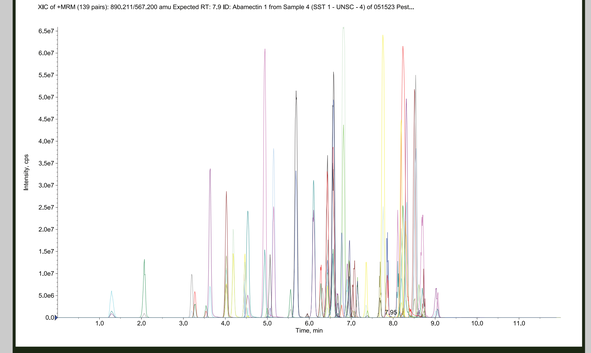

Figure 6: Pesticides Panel with Internal Standards Chromatogram

MS CONDITIONS

MS/MS system	ABSCIEX QTrap 6500+
Ionization Mode	Electrospray Ionization in positive mode (+ESI+)
Ion Spray Voltage (IS)	+4500.00
Temperature (TEM)	300°C
Curtain Gas (CUR)	40
Ion Source Gas 1 (GS1)	50
Ion Source Gas 2 (GS2)	50

LC-MS/MS PARAMETERS

HPLC Column	UCT Selectra® PFPP, 100 × 2.1 mm, 3 µm (p/n: SLPFPP100ID21-3UM)
Guard column	UCT Selectra® PFPP, 10 × 2.0 mm, 3 µm (p/n: SLPFPPGDC20-3UM)
Guard column holder	p/n: SLGRDHLDR
Column temperature	40°C
Flow rate	0.400 µL/min
Injection volume	2 µL

CONCLUSION

This Poster outlines an LC-MS/MS method for the analysis of the California list of pesticides monitored for cannabis products. Analysis of the samples was performed by LC-MS/M utilizing a **Selectra® PFPP HPLC column (** p/n: SLPFPP100ID21-3UM **)** which allowed for improved retention of the more polar pesticides included in the method. Analytes like Daminozide and Acephate are very challenging to retain especially on a traditional C18 HPLC column. The PFPP column offers a balance of retention mechanisms for both polar and nonpolar analytes. The total injection time is 16.5 minutes with only 9 minutes of scan time.

Mobile phase A was comprised of 10mM ammonium Formate with 0.1% Formic Acid in D.I. Water. Acetonitrile was the solvent of choice for Mobile Phase B. The method LOD and LOQ meets the stringent requirements of the state of California. Because of its ability to include both ESI and APCI amenable analytes, this method can be used to reduce the time of analysis dedicated by the instrumentation.

The pesticides panel incorporated five different analytes that have more than one isomer making it very difficult to resolve all of the compounds in the method in a single injection. **UCT's Selectra PFPP HPLC column** was able to achieve resolution of analytes in the method with their respective isomers. UCT is currently dedicated to developing a sample preparation protocol that is going to be essential in mitigating matrix interferences that make it difficult to detect some of the target pesticides in the method.

Disclosure: The speaker, author, moderator, planning member and/or presenter/s do have financial relationships with UCT, Inc. , as defined in the AACC policy on potential bias or conflict of interest. The specific product/s : SelectraCore® PFPP column will be mentioned and/or discussed.

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