

series	cap color	membrane	pore size	part #
eXtremelFV®	●	PVDF	0.45µm	85541

Routine Targeted Quantitation & Identification of Pesticide Residues in Avocado, Carrot, Grape & Orange using the eXtremelFV® by LC-MS/MS

Schreiber, AB SCIEX, Concord, ON, Canada; J. Jasak, AB SCIEX, Darmstadt, Germany. "Routine Targeted Quantitation and Identification of Pesticide Residues using Triple Quadrupole LC-MS/MS and Advanced Scheduling of MRM Transitions" Poster presented as part of NACRW-FPRW Conference, St. Petersburg, FL., 20-23 July 2014.

Introduction

LC-MS/MS is a powerful analytical tool capable of screening samples for numerous compounds. MRM is typically used because of its excellent sensitivity, selectivity, and speed. Using QuEChERS for extraction, eXtremelFV®s for clean-up, and UHPLC combined with core-shell particles columns provides good resolution and excellent peak shape, making it possible to detect hundreds of pesticides of a wide variety of compound classes and chemical properties in each sample. The new AB SCIEX Triple Quad™ 3500 with a Turbo V™ source and Curtain Gas™ interface supplies exceptional robustness and ruggedness. The advanced eQ™ electronics and the curved LINAC® collision cell were designed for unparalleled speed of MRM detection and fast polarity switching for comprehensive multi-component analysis. The method combines QuEChers for extraction, Thomson eXtremelFV®s for clean-up, and the Sciex Scheduled MRM Pro Algorithm for identification of pesticides in fruit and vegetables analysis.

Equipment

- AB Sciex Triple Quad™ 3500 with Turbo V™ source and Electrospray Ionization Positive Polarity
- Column: Phenomenex Kinetex™ Biphenyl 2.6µm column
- Mobile Phase: Fast gradient of Water/Methanol with 5mM Ammonium Formate
- Flow rate: 0.5mL/min

Step	Time(min)	A(%)	B(%)
0	0.0	90	10
1	0.5	90	10
2	2.0	70	30
3	9.0	40	60
4	11.0	20	80
5	12.0	5	95
6	15.0	5	95
7	16.0	90	10
8	20.0	90	10

Sample Preparation

1. Store-bought Avocado, Carrot, Grape & Orange is extracted using dispersive SPE following the European Standard Method 15662
2. SCIEX iDQuant™ standards kit are used for Pesticide Analysis
3. Extracts are diluted and filtered 5x with water in Thomson eXtremelFV®, 0.45µm PVDF membrane

Results

Fig 1. Sensitivity of selected pesticides detected at a concentration of 5ng/mL using the Triple Quad™ 3500 system (click image for larger)

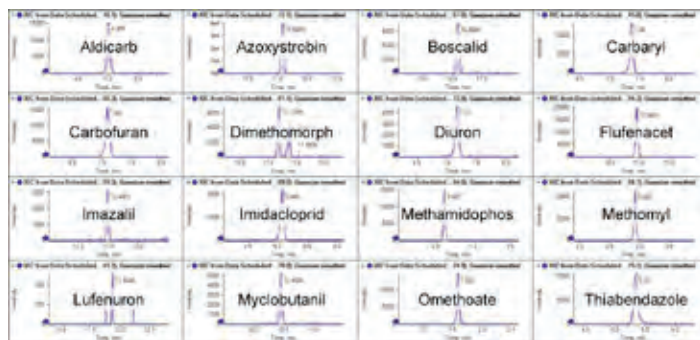
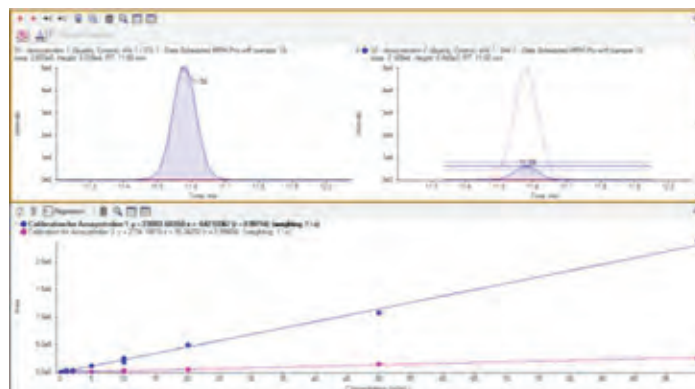


Fig 2. Calibration line of Azoxystrobin from 0.1 to 100 ng/mL (top) and quantifier-qualifier ratio for compound identification (bottom).



Sample	Pesticide	Concentration (µg/kg)	MRM Ratio (Expected Ratio)
Avocado	Azoxystrobin	55.0	0.146 (0.126)
	Imidacloprid	6.2	0.823 (0.818)
	Thiabendazole	2.9	1.035 (0.820)
Carrot	Linuron	14.3	0.613 (0.742)
	Thiabendazole	5.3	0.995 (0.820)
Grapes	Boscalid	17.3	0.240 (0.242)
	Fenhexamid	363	0.973 (1.053)
	Methamidophos	1.2	0.873 (0.698)
	Myclobutanil	14.2	0.811 (0.830)
	Pyrimethanil	687	0.482 (0.435)
	Tebuconazole	7.1	0.030 (0.261)
Orange	Imazalil	1830	0.282 (0.348)
	Thiabendazole	>3000	0.812 (0.820)
Spinach	Boscalid	12.3	0.264 (0.242)
	Dimethomorph	53.7	0.537 (0.541)
	Fenamidone	755	0.749 (0.672)
	Imidacloprid	217	0.907 (0.993)
	Propamocarb	3.1	0.260 (0.336)
	Thiabendazole	3.6	0.917 (0.820)

Conclusion

- The AB Sciex Triple Quad 3500 was used for pesticide residue identification and quantification in store-bought fruit and vegetables.
- Method combines QuEChers extraction, Thomson eXtreme!FV®s, Phenomenex Kintex Biphenyl Column, and the Sciex Scheduled MRM Pro Algorithm.
- Average gain in sensitivity of 3x was observed, with most pesticides having an LOD of < 1ng/mL.