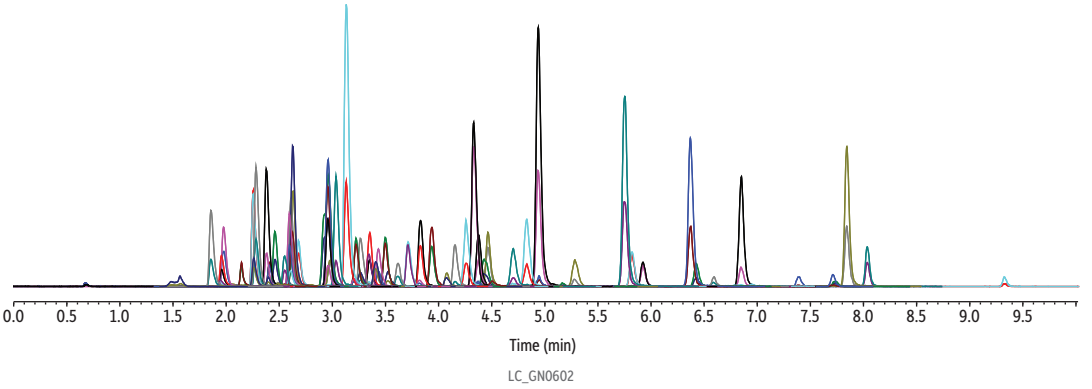
California Cannabis Pesticides and Mycotoxins in Brownies on Raptor ARC-18

- **LC amenable pesticides and mycotoxins regulated by California (2019).**
- **Quantify low ng/g concentrations in cannabis edibles.**



Column	Raptor ARC-18 (cat.# 9314A12)
Dimensions:	100 mm x 2.1 mm ID
Particle Size:	2.7 µm
Pore Size:	90 Å
Guard Column:	Raptor ARC-18 EXP guard column cartridge 5 mm, 2.1 mm ID, 2.7 µm (cat.# 9314A0252)
Temp.:	40 °C
Standard/Sample	California pesticide standard #1 (cat.# 34124) California pesticide standard #2 (cat.# 34125) California pesticide standard #3 (cat.# 34126) California pesticide standard #4 (cat.# 34127) California pesticide standard #5 (cat.# 34128) California pesticide standard #6 (cat.# 34129) Dimethoate-d6 (cat.# 31988) Dichlorvos-d6 (cat.# 31987) Carbaryl-d7 (cat.# 31985) Diazinon-d10 (cat.# 31986) Atrazine-d5 (cat.# 31984) Diuron-d6 (cat.# 31989) Liuron-d6 (cat.# 31990) Aflatoxins standard (cat.# 34121) Ochratoxin A (cat.# 34122) Compounds not present in these mixes were obtained separately.
Diluent:	75:25 Acetonitrile:water
Conc.:	5-15 ng/mL (Expected concentration range in extract of brownie initially spiked at 100 ng/g.)
Inj. Vol.:	2 µL
Mobile Phase	
A:	Water, 2 mM ammonium formate, 0.1% formic acid
B:	Methanol, 2 mM ammonium formate, 0.1% formic acid

Time (min)	Flow (mL/min)	%A	%B
0.00	0.5	95	5
1.5	0.5	35	65
8.5	0.5	5	95
9.5	0.5	0	100
10.5	0.5	0	100
10.6	0.5	95	5
12	0.5	95	5

Detector	MS/MS
Ion Mode:	ESI+/ESI-
Mode:	MRM
Instrument	UHPLC
Sample Preparation	Brownies were pulverized using a SPEX Freezer/Mill grinder and 0.5 g samples were fortified with pesticides and mycotoxins at 100 ng/g. A mix of internal standards was added at 200 ng/g. 1.5 mL of acetonitrile acidified with 1% acetic acid was added to the sample. The sample was vortexed and sonicated for 5 min, and then the supernatant was passed through a 100 mg Resprep C18 SPE cartridge (cat.# 26030). An additional 1.5 mL of extraction solvent (acidified acetonitrile) was added to the sample pellet, and then the sample was vortexed again. The supernatant was passed through the same C18 cartridge. 750 µL of extract was mixed with 250 µL of water, and then centrifuged for 5 min at low temperature (~7 °C). 2 µL of final extract was injected into the LC-MS/MS system.
Notes	Want even better performance when analyzing metal-sensitive compounds? Check out Inert LC columns at www.restek.com/inert

	Peaks	t_R (min)	Precursor Ion	Product Ion 1	Product Ion 2	Polarity
1.	Daminozide-d6	0.6	167.0	149.3	49.3	+
2.	Daminozide	0.7	161.1	44.1	143.2	+
3.	Acephate	1.5	184.0	143.1	95.1	+
4.	Oxamyl	1.8	237.1	72.1	90.1	+
5.	Flonicamid	1.9	230.1	203.1	174.1	+
6.	Methomyl	1.9	163.1	88.1	106.1	+
7.	Thiamethoxam	1.9	292.0	211.1	181.1	+
8.	Imidacloprid	2.2	256.1	209.1	175.1	+
9.	Mevinphos I	2.2	225.1	127.1	193.2	+
10.	Acetamiprid	2.2	223.0	126.1	56.1	+
11.	Dimethoathe-d6	2.2	236.1	205.1	-	+
12.	Dimethoate	2.3	230.0	199.1	125.1	+
13.	Thiacloprid	2.4	253.0	126.0	90.1	+
14.	Mevinphos II	2.4	225.1	127.1	193.2	+
15.	Aflatoxin G2	2.4	331.2	189.3	115.2	+
16.	Aflatoxin G1	2.4	329.2	243.2	215.3	+
17.	Aldicarb	2.5	116.0	89.2	70.2	+
18.	Aflatoxin B2	2.5	315.3	287.2	243.3	+
19.	Dichlorvos	2.6	220.9	109.1	79.2	+
20.	Dichlorvos-d6	2.6	227.0	115.1	-	+
21.	Aflatoxin B1	2.6	313.2	241.2	128.2	+
22.	Imazalil	2.6	297.0	159.0	201.0	+
23.	Carbofuran	2.6	222.1	123.1	165.2	+
24.	Propoxur	2.6	210.1	111.1	93.1	+
25.	Carbaryl-d7	2.7	209.2	152.2	-	+
26.	Carbaryl	2.7	202.1	145.1	127.1	+
27.	Diuron-d6	2.9	239.1	78.2	-	+
28.	Atrazine-d5	2.9	221.2	179.1	-	+
29.	Naled	2.9	397.8	127.1	109.1	+
30.	Metalaxyl	2.9	280.2	220.2	192.2	+
31.	Spiroxamine	2.9	298.3	144.2	100.2	+
32.	Chlorantraniliprole	3.0	483.9	452.9	285.9	+
33.	Phosmet	3.0	318.0	160.1	77.2	+
34.	Azoxystrobin	3.1	404.0	372.1	344.1	+
35.	Linuron-d6	3.1	255.1	160.1	-	+
36.	Fludioxonil	3.2	247.0	180.0	126.0	-
37.	Methiocarb	3.2	226.1	169.1	121.1	+
38.	Dimethomorph I	3.2	388.2	301.2	165.3	+
39.	Boscalid	3.2	342.9	307.1	140.1	+
40.	Paclobutrazol	3.3	294.3	70.1	125.1	+
41.	Malathion	3.3	331.0	127.2	285.2	+
42.	Dimethomorph II	3.4	388.2	301.2	165.3	+
43.	Myclobutanil	3.4	289.1	70.1	125.1	+
44.	Bifenazate	3.4	301.0	198.1	170.2	+
45.	Ochratoxin A	3.5	404.2	239.1	358.3	+
46.	Fenhexamid	3.5	302.1	97.1	55.2	+
47.	Spirotetramat	3.7	374.2	302.1	216.1	+
48.	Ethoprophos	3.8	243.1	131.1	97.1	+
49.	Fipronil	3.8	436.8	331.8	251.9	-
50.	Fenoxycarb	3.9	302.1	88.1	116.1	+
51.	Kresoxim-methyl	4.1	314.2	267.2	222.2	+
52.	Tebuconazole	4.2	308.1	70.1	125.1	+
53.	Diazinon-d10	4.2	315.2	170.2	-	+
54.	Spinosyn A (spinosad)	4.3	732.4	142.2	98.1	+
55.	Diazinon	4.3	305.1	169.2	153.2	+
56.	Coumaphos	4.4	363.1	227.1	307.1	+
57.	Pyridaben	4.4	365.1	309.2	147.2	+
58.	Propiconazole	4.4	342.0	159.0	69.2	+
59.	Clofentezine	4.5	303.0	138.1	102.1	+
60.	Spinosyn D (spinosad)	4.8	746.5	142.3	98.4	+
61.	Spinosyn J (spinetoram)	4.8	748.5	142.3	98.3	+
62.	Trifloxystrobin	4.9	409.2	186.1	145.1	+
63.	Prallethrin	4.9	301.2	123.2	105.2	+
64.	Pyrethrin II	5.2	373.1	161.1	133.2	+
65.	Spinosyn L (spinetoram)	5.4	760.5	142.2	98.1	+
66.	Piperonyl butoxide	5.7	356.3	177.2	119.2	+
67.	Chlorpyrifos	5.8	349.9	198.0	97.1	+
68.	Hexythiazox	5.9	353.1	228.1	168.1	+
69.	Etoxazole	6.4	360.2	141.1	304.2	+
70.	Spiromesifen	6.4	273.2	255.2	187.2	+
71.	Pyrethrin I	6.6	329.2	161.2	105.2	+
72.	Cyfluthrin (qualifier)	6.6	453.1	193.2	-	+
73.	Cyfluthrin	6.6	451.1	191.2	-	+
74.	Cypermethrin	6.8	433.1	191.0	416.0	+
75.	(E)-Fenpyroximate	6.8	422.2	366.1	138.1	+
76.	*trans*-Permethrin	7.4	408.3	183.2	355.1	+
77.	*cis*-Permethrin	7.7	408.3	183.2	355.1	+
78.	Avermectin B1a	7.7	890.5	305.4	567.4	+
79.	Etofenprox	7.8	394.3	177.2	359.3	+
80.	Bifenthrin	8.0	440.0	181.2	166.2	+
81.	Acequinocyl (precursor ion 1)	9.3	402.3	343.2	189.0	+
82.	Acequinocyl (precursor ion 2)	9.3	386.0	344.2	189.1	+