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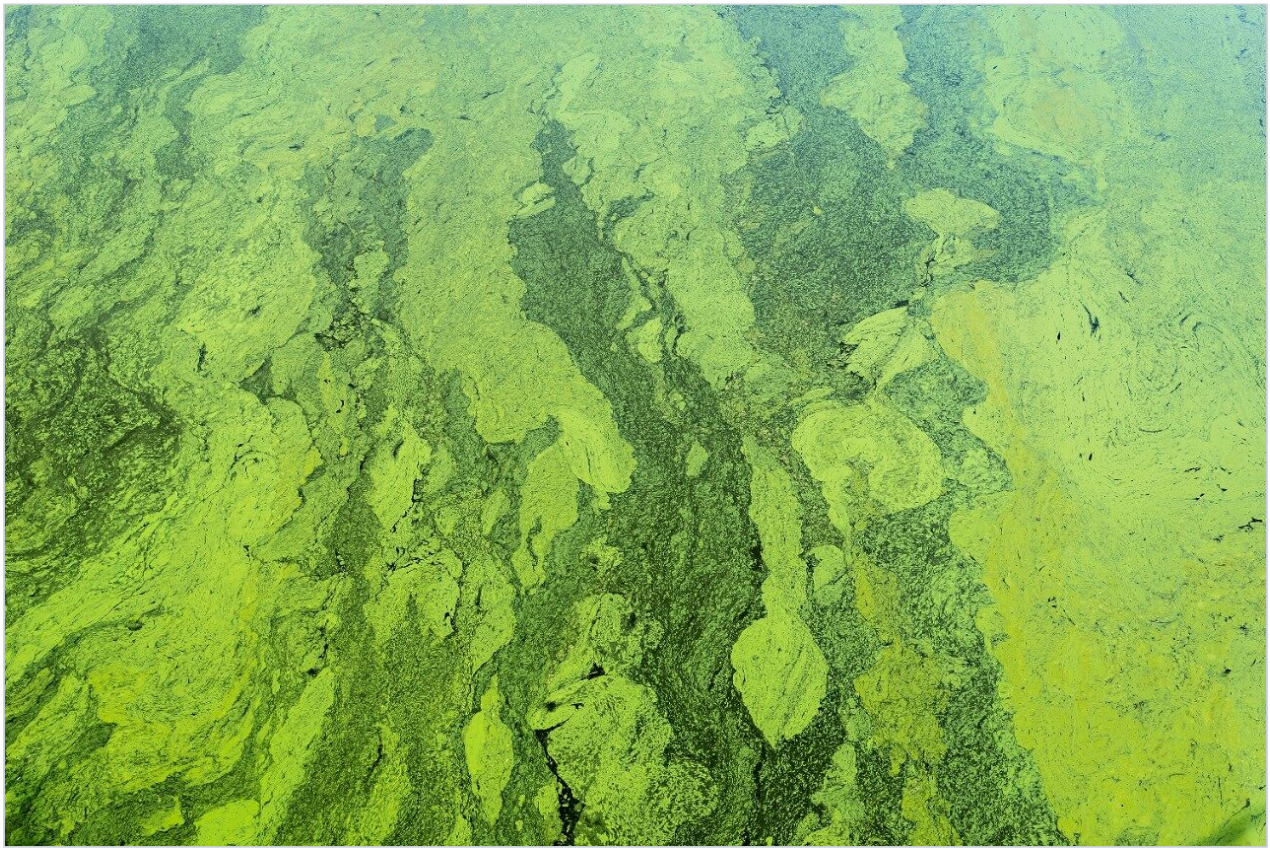
Microcystins in Natural Waters

Waters Corporation



This is an Application Brief and does not contain a detailed Experimental section.

Abstract

Microcystin-LR is a potent mammalian toxin which is known to have been responsible for the deaths of domesticated animals, livestock loss, and the potential presence in potable water supplies.

Introduction

Microcystin-LR is a potent mammalian toxin which is known to have been responsible for the deaths of domesticated animals, livestock loss, and the potential presence in potable water supplies.

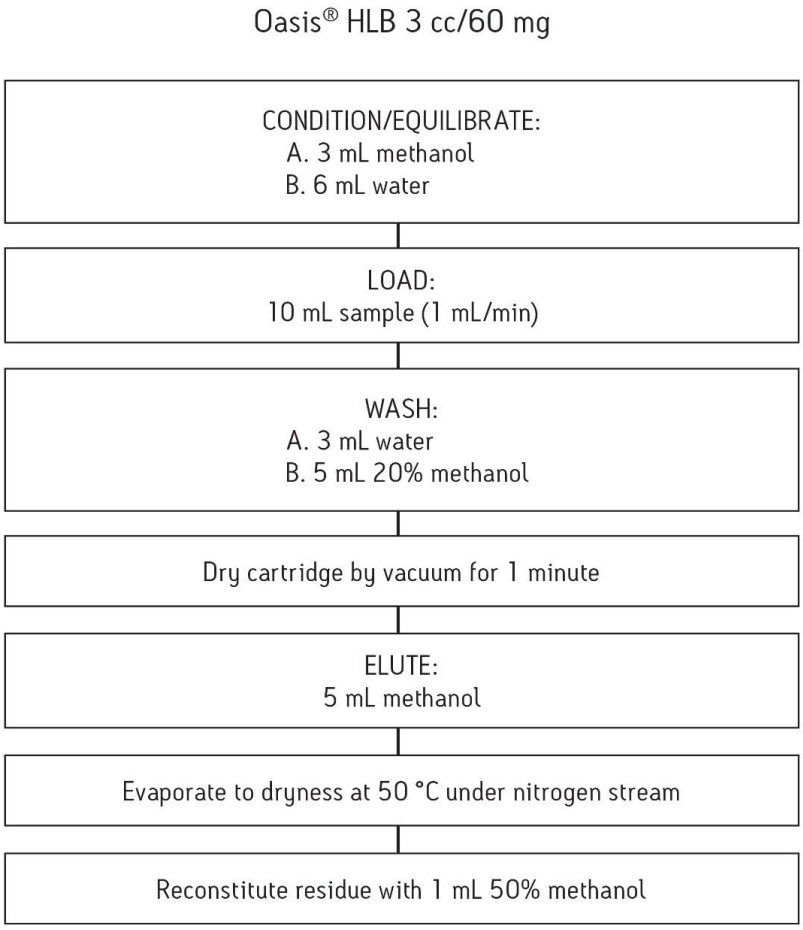
Experimental

Pretreatment

1. Filter water sample through 0.45 µm membrane filter.

2. Add 100 µL of enkephalin (concentration 10 µg/L) to 10 mL filtered water sample and mix thoroughly.

SPE Procedure



LC Conditions

System:	Alliance HPLC 2695
Column:	Symmetry300 C_{18}, 3.5 µm, 4.6 x 75 mm
Flow rate:	0.2 mL/min
Mobile phase A:	0.2% formic acid in water
Mobile phase B:	0.2% formic acid in methanol
Injection volume:	10 µL

Column temp.:	30 °C

Gradient

Time (min)	%A	%B
0	45	55
12	10	90
12.5	0	100
15	0	100
15.1	45	55
25	45	55

MS Conditions

MS System:	Waters Quattro Ultima Pt
Ionization mode:	Positive electrospray (ESI^+)
	Multiple reaction monitoring

Analyte	MRM	MW	$[M+H]^+$	$[M+H]^{2+}$	Characteristic Ion Fragment
Enkephalin	556.1 → 278.0	555.6	556.1	N.D	278.0
					397.1
MCYST-LR	519.9 → 135.0	994.5	995.7	498.4	135.0
					861.5
MCYST-RR	498.4 → 135.0	1037.6	1038.4	519.9	135.0
					620.0
MCYST-LW	1025.8 → 891.7	1024.5	1025.8	N.D	897.1
					583.2
MCYST-LF	986.8 → 852.5	985.5	986.8	N.D	852.5
					544.0

Results and Discussion

Analyte	Concentration (µg/L)	Average Recovery (%)	RSD (%)
MCYST-RR	0.10	100.0	6.45
	0.20	95.2	4.02
	0.40	90.0	4.35
MCYST-LR	0.02	105.0	5.40
	0.05	96.0	4.53
	0.08	93.8	4.22
MCYST-LW	0.40	103.8	5.30
	1.00	102.7	5.87
	1.60	93.8	5.67
MCYST-LF	0.20	103.0	7.03
	0.50	109.8	5.69
	0.80	102.3	4.57

Recovery data for spiked samples at various concentrations.

References

1. Determination of Microcystins in Natural Water by Liquid Chromatography Tandem Mass Spectrometry, Chen Qi, Huang Baifen, Zhang Jing, Ren Yiping; Zhejiang Provincial Center for Disease Prevention and Control.

Featured Products

Alliance HPLC System <https://www.waters.com/534293>

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