

Nodularin Report

Project: Central Davis Sewer District

Submitted to: Leland Myers
 Organization: Central Davis Sewer District
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 Sample Receipt Date: 13 October 2022
 Sample Condition: 22.1 °C upon receipt
 Report #: 221011_CDS
 Date Prepared: 25 October 2022
 Prepared by: Amanda Foss

Table 1: Samples analyzed

<u>Sample Identification</u>	<u>Description/Site</u>	<u>Collection Date</u>
FB1	Great Salt Lake	11 October 2022
FB4	Great Salt Lake	11 October 2022

Analytes: Nodularin-R (NOD)

Abbreviations			
MRL	Method Reporting Limit	FS	Field Sample
MDL	Method Detection Limit	LFSM	Lab Fortified Sample Matrix
Blank	Water/buffer free from interferences	LFSMD	Lab Fortified Sample Matrix Duplicate
LFB	Lab Fortified Blank	LD	Lab Duplicate
MB	Method Blank	IS	Internal Standard
CCC	Continued Calibration Check	—	Not Analyzed
ND	Not Detected above the MDL/MRL	NA	Not Applicable

Sample Preparation

Water Sample Freeze Thaw

The samples were inverted for 60 seconds to mix and 40 mL aliquots were removed for phycollogical analyses. Three freeze/thaw cycles were conducted on 30 mL aliquots to lyse cells and release of toxins.

Extraction

NOD

Sample aliquots (10 mL) were fortified with internal standard (IS) with a duplicate LFSM. Preconditioned Strata X Polymeric SPE (200 mg) columns were loaded with sample, rinsed with deionized water and eluted with 90% acetonitrile. Elutions were blown to dryness (N₂ at 60°C) and reconstituted in 0.5 mL deionized water (20-fold preconcentration). All samples were filtered (0.2 µm PVDF) prior to LC-MS/MS.

Analytical Techniques

Liquid chromatography mass spectrometry/mass spectrometry (LC-MS/MS)

NOD

LC-MS/MS was used for a targeted nodularin-R analysis. The [M+H]⁺ ion for NOD (*m/z* 825.5) was fragmented and the product ions (*m/z* 389.4, 674.5, 691.5, 753.5, 781.5, 808.0) were monitored. The [M+H]⁺ ion for the internal standard [¹⁵N₁₀]MC-LR (*m/z* 1005.5) was fragmented and the product ion (*m/z* 987.5) was monitored. The internal standard method was used in quantification.

Quality Control

Table 2: Lab fortified matrix sample (LFSM) and internal standard (IS) returns prepared for analyses pre-extraction. Additional QA/QC checks included LFBs, continued calibration checks and external curves.

Analyte	Concentration (ng/mL)	Sample ID(s)	QC Type	Return
NOD	0.1	FB1	LFSM	126%
[¹⁵ N ₁₀]MC-LR	0.5	all samples	IS	68 ± 5%

*Control limits: water LFSM ± 30%; complicated matrix LFSM and when LFSM within 2x MDL ±50%; IS ± 50%

Qualifier	Flag
CL	Analytical result is estimated due to ineffective quenching.
J	Analyte was positively identified; the associated numerical value is estimated.
PT	The reported result is estimated because the sample was not analyzed within required holding time.
B	Analytical result is estimated. Analyte was detected in associated reagent blank as well as the samples.
E	Analytical result is estimated. Values achieved were outside calibration range.
N	Spiked sample control was outside limits
T	The reported result is estimated because the sample exceeded temperature threshold when received


Summary of Results

Table 3: Summary results for LC-MS/MS analysis of nodularin-R (NOD), reported in ppb (ng/mL).

Sample ID	NOD (ng/mL)
FB1	ND ^T
FB4	ND ^T
<i>MDL (ng/mL):</i>	<i>0.05</i>
<i>Analyst Initials:</i>	<i>AF</i>
<i>Date Analyzed:</i>	<i>10/25/2022</i>

Interpretations:

Nodularin-R (NOD) was not determined present above the method reporting limit.

Submitted by: 
Mark T. Aubel, Ph.D.
Date: October 25, 2022

*This results in this report relate only to the samples listed above.
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