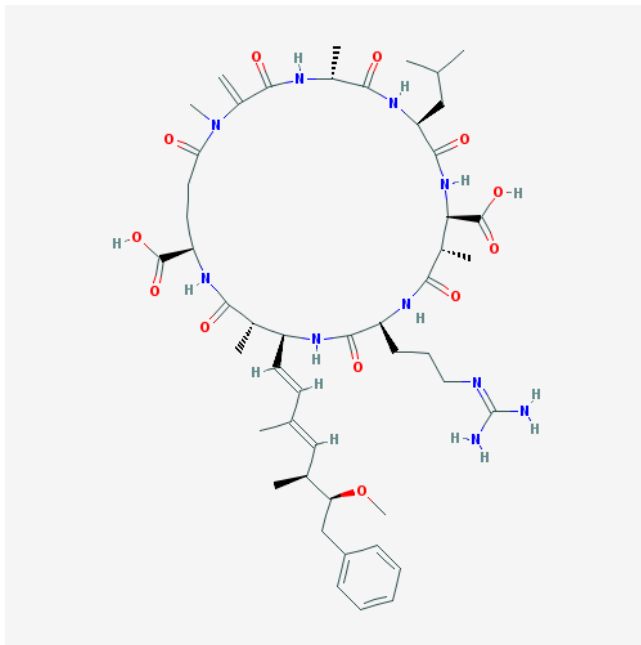


# Pool Operator Talk

with Aquatic Facility Training & Consultants

## Posts



## Black Algae Toxicity

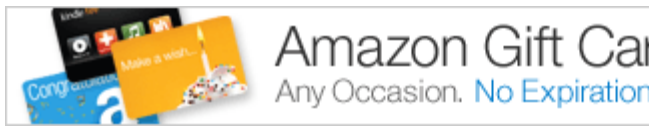
🕒 December 3, 2018    👤 Rudy Stankowitz    💬

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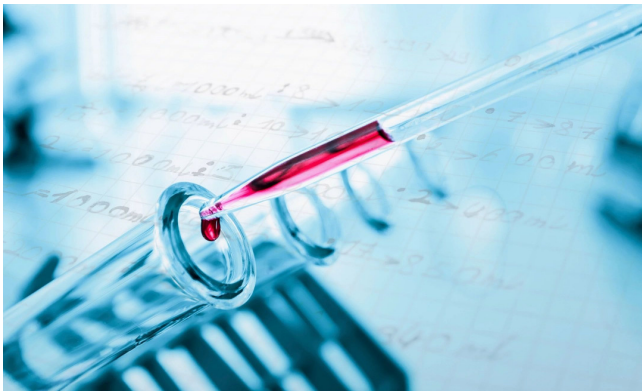
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into our monthly  
eNewsletter. ↓ ↓ ↓

**Email** ✉



# MICROCYSTIN RESULTS



**Due to the level of chlorine in our sample,** testing the pool water for microcystin would be futile. If the *Oscillatoria sp.* found in our “black algae” specimens were actually toxin excreting, the disinfectant (even at the low end of the acceptable range: 1 ppm), we hypothesize, would likely oxidize the hepatotoxins upon production (further testing required). This does not mean we are unable to test our

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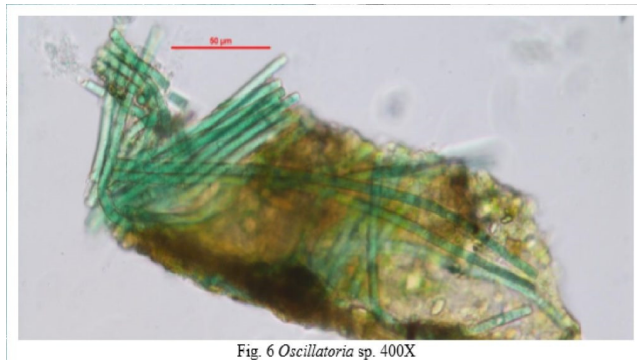
## Trending Pool Posts:

[🌿 Invasive Florida: Nonnative Species Found In Swimming Pools](#)

[⚠️ Prevent Drowning In Your Backyard Pool](#)

[☁️ How to Clear Cloudy Pool Water Fast](#)

specimens for toxins, only that we would be unable to test the water for such.



Actual photo of *Oscillatoria sp.* found in our samples taken on Nov 1, 2018

**As we had mentioned previously, cyanobacteria that are associated with toxins** extricate toxins in one of two methods. Either the prokaryote generates toxins, or it releases toxins when lysed (cell membrane is ruptured). Though the chemistry of the swimming pool water will thwart efforts to confirm continuous excretion of microcystin, we may still be able to detect if toxins are released due to lysis. To do this, the chlorine would first need to be

Finding the Time to  
Take Time Off 🕒  
#smallbusinessevery  
day

Kids' Coloring  
Contest 🖍

🤢 Oh Crap,  
Someone Pooped In  
The Pool!

🧪 Top 10 Swimming  
Pool Test Kits

How Often Should I  
Shock The Pool? 🧑

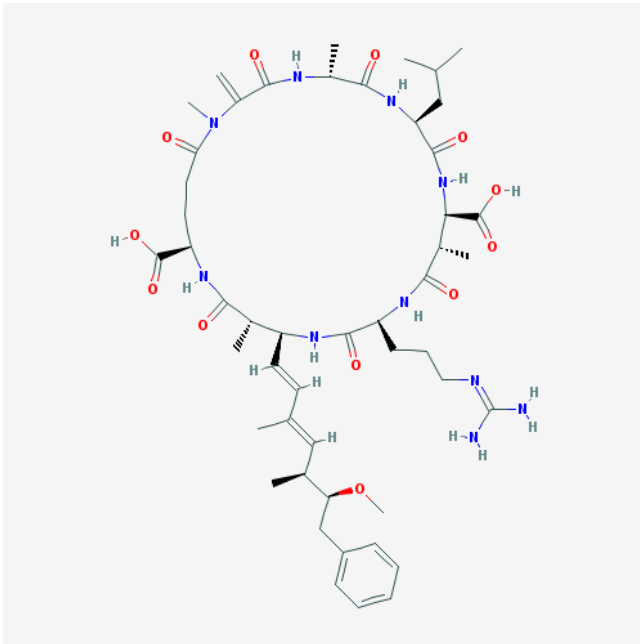
## What Pool Peeps are Saying:

Jaana McEntee on  
How Often Should I  
Shock The Pool? 🧑

Polly on How Often  
Should I Shock The  
Pool? 🧑

Alessia Marciano on  
How Often Should I  
Shock The Pool? 🧑

neutralized. This would be done prior to testing with either ascorbic acid or sodium thiosulfate. Here we would choose ascorbic acid.



Microcystin, Source: PubChem, URL:

<https://pubchem.ncbi.nlm.nih.gov>

Description: Data deposited in or computed by PubChem

*Cyanobacteria release toxins upon cell death or lysis. When released, toxins may persist for weeks to months...Most microcystins are hepatotoxins (liver toxins)...While the liver is the primary target of microcystins, it is also a skin, eye*

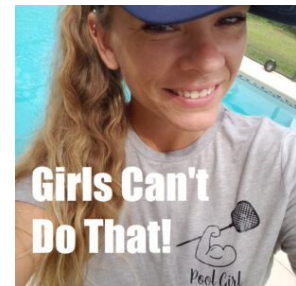
Nursery rhymes girl on How Often Should I Shock The Pool? 🧑

Glorious Heights on How Often Should I Shock The Pool? 🧑

Neil Alvin on How Often Should I Shock The Pool? 🧑

💧 **Pool Peeps Choice 🏆 Top 10 of the Last 365:**

#PoolGirlPower 🧡



Swimming Pool Horror Movie: 12

and throat irritant – Water  
Treatability Database/ US EPA

Results from our analytical workup:

GreenWater Laboratories  
205 Zeagler Drive  
Suite 302  
Palatka FL 32177  
Ph (386) 328-0882  
Fax (386) 328-9646

Contact:  
markaubel@greenwaterlab.com  
amandafoss@greenwaterlab.com



Aquatic Facility Training & Consultants							
MICROCYSTIN RESULTS							
Sample ID	Initial Conc.	Dilution	Assay	Final Dilution	Avg. LFI	Avg. LFSM	Final
Date Collected	Factor	Ratio	Value, ng/mL	Factor	Recovery	Recovery	Concentration (ng/mL)
Black Algae	1x	none	0.08	1	91%	100%	<0.15
11/15/2018	1x	none	0.07	1			<0.15

ND = Not detected above LOD/LOQ  
LOD/LOQ = 0.15 ng/mL  
FS = 1.0 ng/mL MCLR  
LFSM = 1.0 ng/mL MCLR

Submitted by:  
Amanda Foss, M.S.  
Date: 11/15/2018

Submitted to:  
Rudy Stankowitz  
Aquatic Facility Training & Consultants  
Gainesville, FL 32610  
(352) 568-0229  
rudy@aquaticoperatorcourse.com

The Assay value in our test results (above) show that a positive test was achieved indicating that a trace level of microcystin was detected in our specimens. However, at 0.08 ng/mL (parts per billion); the level detected by the ELISA in our samples is much lower than the benchmark of 0.15 ppb (shown). The amount detected is also far below the EPA Drinking Water Health Advisory (HA) maximum recommended level of 1.6 micrograms per liter (ppb).

Feet Deep



Home Swimming

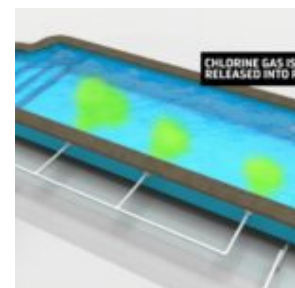
Pool IQ Quiz



Chlorine Gas Cloud

Injuries at Public Pools Caused by Liquid Chlorine Injection

Malfunction



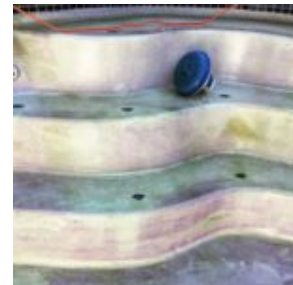
All "Black Algae" Are NOT Created Equal



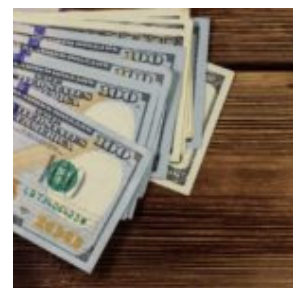
As discussed in our article *Not All Black Algae is Created Equal* ⚖️ and then again in 🧫 *Does Black Algae Produce Toxins?*, we will need to understand that the likelihood of the presence of trace toxins will need to be considered on a case to case basis. Remember, we found the inhabitants of “black algae” to vary by geographic location and though all “black algae” will have cyanobacteria as the dominant constituent, not all cyanobacteria found in “black algae” will be known to be cyanotoxin producing. Then consider that environmental factors may also play a role in whether a known toxin producing genus actually is toxin producing. It is then safe to assume that the specific genus discovered, as well as the abundance of the prokaryote, will determine the level of toxin present – if any at all.



Copper Stains in Swimming Pools 🧑



Afraid to Raise Your Price for Pool Service? 💰



Black Algae Copper Experiment 🔬





**As Dr. Goeres (Center for Biofilm Engineering, Montana State University)** had commented on our findings in *Not All Black Algae is Created Equal* 🏛️, “the best approach may be tailored treatment plans that are optimized for each pool similar to the “personalized medicine” trend”. The same philosophy of treating colonization as individuals for treatment will also pertain to the likelihood of the presence of toxins, and then toxin type. “Black Algae” may always look the same, but each colony is actually as unique as your fingerprint.

*Cyanotoxins can be classified into categories that reflect their biological effects on the systems and organs that they affect most strongly. Each cyanotoxin can be produced by more than one cyanobacterial species; likewise, several toxins can be found within*

That Chlorine Smell



Available Chlorine Content vs. Active Strength... Huh? 🤔



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*the same species – Cyanotoxin Fact Page, Center for Earth and Environmental Science, Indiana University – Purdue University, Indianapolis*

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## Our May 2018 discovery that sent us down this path: **The Black Algae Myth**

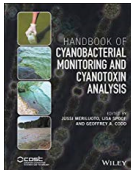

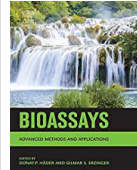
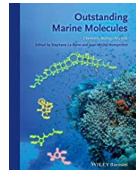
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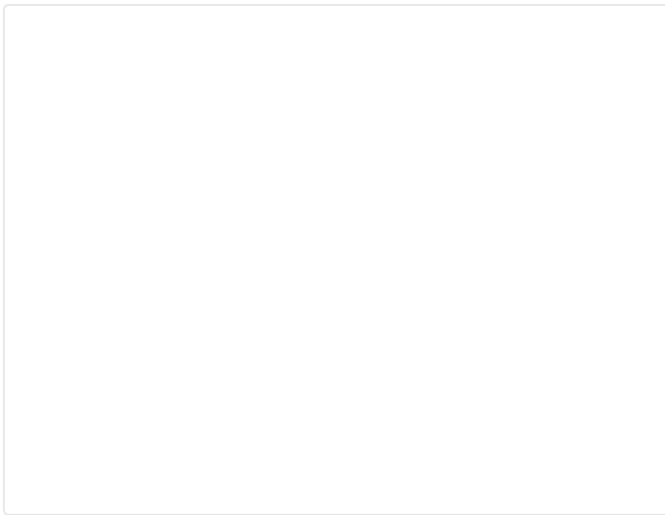
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