What Makes Cyanobacteria Harmful?

Cyanobacteria such as *Microcystis* are commonly found in freshwater environments, and are usually harmless. In fact, in small numbers, cyanobacteria are quite beneficial to the environment as primary producers with high nutritive value. However, when environmental conditions are favorable to the cyanobacteria, they can reproduce rapidly or “bloom” and become a large nuisance.

When the cyanobacteria begin to die, they can cause odor issues, deplete dissolved oxygen in the water, and may produce toxins called “cyanotoxins.” These toxins can also be released while the organism is still alive.

*Microcystis* blooms can produce a specific type of toxin called microcystins. When ingested, microcystins primarily affect the liver, but may also affect other body systems as well. Such harmful algal blooms pose threats to fish, animals, and in rare cases, humans. However, please note that algal blooms do not always produce toxins.

What You Can Do

Although there are many natural factors that contribute to an algae bloom, there are steps people can take to reduce the amount of nutrients that enter the lake. Dispose of organic (food) wastes properly, drain your pool water into the sewer instead of the street, try to minimize the use of fertilizers, and manage your landscape to capture and absorb as much rainwater as possible to reduce stormwater runoff from your property.

Furthermore, you can contact the people and organizations below if you have any questions, concerns, or if you would like to report a bloom.

**Arizona Department of Environmental Quality**
Email: brd@azdeq.gov
Phone: 1-602-771-8762

**Mohave County Public Health Department**
Email: Bill.Flynn@mohavecounty.us
Phone: 1-928-757-0901

Due to the blue-green slimy appearance of *Microcystis* when it blooms, it is commonly called “blue-green algae.”

Understanding Harmful Algae Blooms in The Lower Colorado River

*Microcystis*
What to Look for

*Microcystis* generally occurs in small dispersed colonies that look like sprinkles of yellow-brown to green “glitter”, but may also cluster as wind-rowed streaks or as frothy “pea soup” masses that can cover a considerable area.

What Causes Algal Blooms?

In many cases, algal blooms are caused by excessive nutrients, usually phosphates, discharged into the water body from wastewater treatment facilities, livestock feed lots, agricultural fields, and water runoff from urban areas. This extra nutrient supply fills a natural gap or limitation that normally impedes rapid algae growth.

Explosive growth of cyanobacteria in the Lower Colorado River probably results from another cause as excessive nutrient sources are not as common. Instead, the selective feeding habits of quagga mussels favor *Microcystis* survival as its competitors (other algae) are consumed by the mussels.

Warm winter temperatures also favor *Microcystis* growth.

Do's and Don’t's of Harmful Algae Blooms

**Do** avoid contact with water where algae are present (i.e. floating mats, scum layers, “pea soup” colored water).

**Don’t** allow children or pets to play in or drink water where algae is present.

**Do** contact your local health department to report any large blooms.

**Don’t** use algacides to kill the cyanobacteria; when the cells die, the toxins are directly released into the water.

**Do** obey posted signs for beach closings.

**Don’t** drink untreated surface water even if you don’t see algae. Boiling the water will not remove the toxins.

**Do** rinse yourself and/or your pet off after swimming in any lakes, ponds, or streams even if algae is not visible.

**Don’t** jet-ski or boat over algal mats.

Cyanotoxin Effects

Although cyanotoxins along the Colorado River have primarily consisted of microcystins, there are many other types of toxins that can be produced by cyanobacteria in algal blooms. Such diverse toxins can affect the central nervous system, reproductive system, liver, or kidneys. However, even though cyanotoxins are considered a health hazard, there are few documented cases of human illness attributed to them. In most of these cases, humans had been directly ingesting the toxins through untreated surface water in large quantity, or over the course of several days. Therefore, harmful exposure to humans is unlikely if proper precautions are taken.

<table>
<thead>
<tr>
<th>In Humans</th>
<th>In Animals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source:</strong> Physical Contact</td>
<td><strong>Source:</strong> Ingestion</td>
</tr>
<tr>
<td>Headache, incoherent speech, loss of coordination, drowsiness, tingling, burning, and numbness in limbs, abdominal pain, nausea, vomiting, diarrhea, and stomach cramps, abnormal kidney function, kidney damage, liver inflammation, and muscle aches</td>
<td>Fatigue</td>
</tr>
<tr>
<td>Irritation in eyes, throat, and nose, blistering around the mouth, skin rash including tingling and Numbness</td>
<td>Shortness of breath</td>
</tr>
<tr>
<td>Dry cough, sore throat, pneumonia, shortness of breath, and loss of coordination</td>
<td>Convulsions</td>
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Unlike humans, numerous fatal incidences have been reported in animals—wildlife, livestock, and pets are at high risk of developing illness if they have ingested cyanotoxins. It is therefore extremely important that you are conscious of pets or livestock that you care for, and their exposure to untreated surface water (especially if an algal bloom is present).