Controlling harmful Algae Blooms With The Prebiotic Bacteria Enhancer (PEB)

Employing a water treatment approach that integrates our advanced water bioremediation technology with a comprehensive understanding of the complex microbial ecosystems within water bodies.

CYANOBACTERIA BLOOMS

Cyanobacteria such as *Nodularia spumigena* are capable of fixing nitrogen from the atmosphere, enabling them to survive and proliferate in saline waters, even when nitrogen levels are low. This unique ability allows them to outcompete other organisms that rely on external nitrogen sources.

However, *Nodularia spumigena* produces the toxic nodularin, which can cause severe health problems, particularly liver damage, in both animals and humans.

When harmful algal blooms occur, public health officials often advise people to avoid contact with affected waters. These advisories can significantly impact local economies by deterring tourism, recreational activities, and even local investment.

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Algae Control Australia
Restoring your waters ecosystem

About cyanobacteria and phytoplankton

Phytoplankton and cyanobacteria are both microscopic organisms found in water. While phytoplankton are diverse organisms, including algae, cyanobacteria are a type of bacteria that can photosynthesize, using sunlight to produce their own food.

Cyanobacteria, ancient organisms found in diverse aquatic and terrestrial environments, play a crucial role in Earth's oxygenation, making earth stand out from other terrestrial bodies with its diverse forms of life and ecosystems.

Phytoplankton however is a more inclusive term, referring to all microscopic photosynthetic organisms in water, including various types of algae and interestingly cyanobacteria too.

So in some sense, while all cyanobacteria are phytoplankton, not all phytoplankton are cyanobacteria.

While essential to ecosystems, certain cyanobacteria species can produce harmful toxins. These toxins can contaminate water bodies, leading to beach closures and health risks for both animals and humans.

Cyanobacteria therefore exhibit a dual nature: essential for life but potentially harmful for humans, fish and other animals when conditions favour their dominance.

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How PEB Stops Cyanobacteria Blooms

"PEB encourages the growth of beneficial *Bacillus* bacteria, which outcompete and suppress harmful cyanobacteria blooms."

1. **Exclusion via food source:** When *Bacillus* bacteria are introduced into water bodies, they compete with cyanobacteria for vital nutrients such as nitrogen and phosphorus. Due to their efficient nutrient uptake mechanisms, *Bacillus* bacteria can outcompete cyanobacteria, limiting their access to essential resources and preventing their excessive growth ultimately starving them out.
2. **Production of Cyanobacteria-Inhibiting Compounds:** Some *Bacillus* strains can produce a range of enzymes and antimicrobial compounds, including proteases and lipases. These substances can effectively target and disrupt the cellular structure of cyanobacteria, inhibiting their growth and proliferation.
3. **Bioaugmentation:** Bioaugmentation with *Bacillus* bacteria boosts the diversity of beneficial microorganisms in the water body. This balanced microbial community can outcompete harmful cyanobacteria, reducing their ability to form harmful blooms.
4. **Organic Overload Reduction:** Bacillus bacteria play a crucial role in reducing the nutrient load in water bodies. They decompose organic matter, a primary food source for cyanobacteria, and decrease the concentration of nutrients like nitrogen and phosphorus. This reduction in nutrient availability limits the growth potential of cyanobacteria, mitigating the risk of harmful algal blooms. Also by consuming the “luxury consumption” of nutrients removes the food source for many floating and sludge dwelling weeds.

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