

CONCERNS ABOUT PET POISONING

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Poisoning from planktonic blue-green algae (cyanobacteria) in the surface waters is a real concern, as in Discovery Bay, California for example. Thus, we closely monitor the algal populations in the Wai Kai Lagoon (Lagoon). All bodies of water are at risk for an algal bloom, from your aquarium to the open ocean. Fortunately, less than 1% of all algal blooms actually produce toxins (<https://oceanservice.noaa.gov/facts/habharm.html>). Few blue-green algal species are toxic, and even potentially toxic blue-green algae do not always produce toxins. In fact, most planktonic blooms are beneficial in that the algae are food for the animals in the water and serve as the major source of energy in the aquatic food web.

Harmful algal blooms in Hawai'i are rare, and largely limited to visible plant-like macroalgae. For example, the notable 2002 algae bloom in Lake Wilson, the largest body of freshwater on O'ahu, was not due to blue-green algae but to the overgrowth of an aquarium water fern. Similarly, the algal bloom in Kaelepulu Pond in Enchanted Lakes in 2011 was due to another plant-like algae and not blue-green algae (cyanobacteria). It should be noted that although these blooms were nuisance blooms and harmful in some way, they were not toxic. In fact, we are not aware of any reported toxic algal blooms or blue-green algal blooms in the waters on O'ahu. As of 2016, no harmful cyanobacteria blooms had been reported in the State of Hawai'i (<https://www.usgs.gov/news/science-harmful-algae-blooms>).

The Merck Veterinary Manual is one of the most comprehensible, reliable references for veterinary professionals. It offers some excellent suggestions for the prevention and control of cyanobacteria blooms, namely different mechanisms for the removal of the phosphorus that is required for rapid growth (<https://www.merckvetmanual.com/toxicology/algal-poisoning/overview-of-algal-poisoning>). Rather than adding chemicals or other artificial agents to the Lagoon as suggested, we utilize a natural control method to remove excess phosphorus from the Lagoon water. The native plant-like green algae *Chara* covers over 80% of the Lagoon bottom, and effectively absorbs the phosphorus from the water column. This means there is very little phosphorus available for the growth of planktonic algae in the surface waters, including the blue-green algae in question. For comparison, the phosphorus levels in Wai Kai Lagoon are 100X less than that in Lake Wilson and equivalent to or just less than the coastal waters adjacent to the Lagoon. Flow maintenance and water mixing are also suggested in the Merck Veterinary Manual as mechanisms to prevent stagnation, another condition that can promote rapid algal growth. The Lagoon waters are naturally wind-driven and well-mixed top to bottom, negating the need for flow manipulation as a preventative measure.

Since we began monitoring the planktonic algae in the Lagoon in 2013, we have not detected any of the cyanobacteria that are known to produce toxins. For a list of the species that can produce toxins see Table 1 in https://www.epa.gov/sites/production/files/2014-08/documents/cyanobacteria_factsheet.pdf. In fact, the only cyanobacteria known to be present in the Lagoon are non-toxic species that are ubiquitous in coastal waters and dominate the pristine waters of the open ocean.

Fortunately, blue-green or cyanobacterial blooms are easily recognizable as a dense scum on the surface of the water or “...looks like blue or green paint on the surface of the water (<http://www.petpoisonhelpline.com/poison/blue-green-algae/>).” The Center for Disease Control recommends that you avoid entering or playing in any body of water that:

- Smells bad.
- Looks discolored.
- Has foam, scum, or algal mats on the surface.
- Contain or are near large numbers of dead fish or other dead animals (for example, don’t go in a body of water if dead fish have washed up on the shore or beach).

<https://www.cdc.gov/features/harmful-algal-blooms/index.html>

For our part, we continue to closely monitor the cyanobacteria and other algae in the Lagoon, as well as employ and evaluate preventative measures against bloom development.