

Letter to the Editor, Gulf islands Driftwood: September 9, 2011

### **Protect our water sources**

Many years ago, as I walked along the shoreline of St. Mary Lake, I was struck by the sight of a vivid blue green scum along the waters edge. You would think that someone had spilled a can of oil paint. I now know that what I saw was a bloom of blue green algae, more correctly identified as cyanobacteria.

Cyanobacteria are thought to be some of the earliest life on earth, found in fossil records from 3.5 billion years ago. These bacteria, comprised of numerous species, are very adaptable, living in conditions ranging from deserts and hot springs to the Antarctic, but many species prefer warm water, adequate nutrition and light. Under ideal conditions for growth, the bacterial cells can multiply rapidly, forming a bloom, or if wind blown, a scum along a shoreline.

Some species of cyanobacteria produce toxins which are liberated into drinking water. Acute toxicity, resulting in death in human populations, is not common because the drinking water becomes distasteful and people avoid its use. However, exposure to lesser concentrations of toxins may cause abdominal pain, vomiting, diarrhea and headaches, as well as liver and kidney damage.

The health effects of long term exposure to lower levels of toxins have been examined. Based on rodent and pig studies, the World Health Organization (WHO) has determined a provisional guideline for microcystin LR, a common cyanobacterial toxin, which may be used as a basis for drinking water regulations. Microcystin LR has been shown to promote the growth of tumor precursors raising concerns about cancer.

World wide, there have been numerous instances of domestic animal deaths from drinking water containing a high concentration of cyanobacterial toxin.

Toxic cyanobacteria are present at times in our lakes, particularly those that are enriched with nutrients from development in their watersheds, soluble phosphorus being a key nutrient to promote blooms of cyanobacteria.

Over time, cyanobacteria have evolved mechanisms to help them compete with algae for nutrients and light, and avoid predation. For instance, many have the ability to move up and down in the water column to obtain nutrients, warmth and light as the seasons change and the lakes stratify.

Drinking water treatment to remove the bacterial cells is possible but may liberate toxins into the water. Removing toxins is much more difficult and expensive, and requires constant monitoring to be effective. Any failure in the process would put water consumers at risk.

Two trends are of concern for the near future.

1. Global warming is raising water temperature in our lakes, favouring the increased growth of toxic species such as *microcystis aeruginosa* and *cylindrospermopsis raciborskii*.
2. Rapid growth in water demand will force an increased dependency on St. Mary Lake, which is vulnerable to more serious toxic blooms in the future.

The expert advice is to protect our sources.

Mike Larmour