What are the potential implications of a *Gloetrichia* bloom?

- *Gloeo* may negatively impact human health. Swimming in a *Gloeo* bloom can irritate skin and create a rash.

- *Gloeo* does contain a low level of toxins, so drinkiing water containing lots of *Gloeo* colonies may be harmful. However, Lake Sunapee has never experienced a bloom with high enough *Gloeo* concentrations to impact the lake's pristine water quality.

- *Gloeo* may disrupt existing food webs in a lake. It can potentially outcompete other algae for resources, thus negatively affecting species dependent on those algae for food.

These potential implications are being examined and thoroughly studied by researchers at LSPA and Dartmouth College.

Cyanobacterial bloom, Lake Sunapee, 2013

Want to know more about *Gloeotrichia echinulata*?

Contact LSPA for more information.

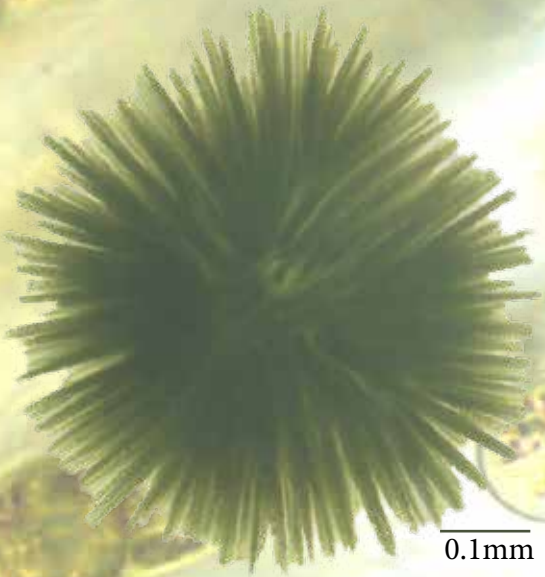
Gleo coloniees compared to pondweed leaves.

Lake Sunapee Protective Association
63 Main Street, PO Box 683
Sunapee, NH 03782
Phone: 603.763.2210
Fax: 603.763.2077
Email: lspa@lakesunapee.org
Website: www.lakesunapee.org

C. Carey 2006; Revised 2016

Gloeotrichia echinulata

an alga in Lake Sunapee



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LSPA

Devoted to the Environmental Quality of the Lake Sunapee Watershed

Gloeotrichia echimulata, or "*Gloeo*," a blue-green alga, or cyanobacterium (see LSPA's Cyanobacteria brochure) has recently started appearing in oligotrophic (high water quality and low nutrient) lakes throughtout northern New England, including in Lake Sunapee. This phamphlet describes some of the Gloeotrichia's characteristics and details the alga's life cycle in a lake. Because *Gloeo* is a recent arrival in oligotrophic lakes, much of what we know about this organism comes from research conducted in eutrophic (low water quality and high nutrient) Scandinavian lakes, where *Gloeo* is very prevalent and well studied.

Winter

Throughout the long cold months of winter, resting cells called akinetes are protected within the dead parent colony on the lake sediment. During this time, the akinetes are in a dormant-like stage.

Gloeo forms large spherical colonies that grow to approximately 1/16th of an inch and resemble tapioca on the lake surface. A *Gloeo* colony has a yellow-green center, with hundreds of surrounding filaments radiating from its core.

There are three major 'ingredients' that are necessary in a lake for *Gloeo* to bloom

- nutrients
- high light levels
- warm temperatures

Research is focused on understanding *Gloeo's* nutritional requirements, enabling better management of its blooms.

Spring

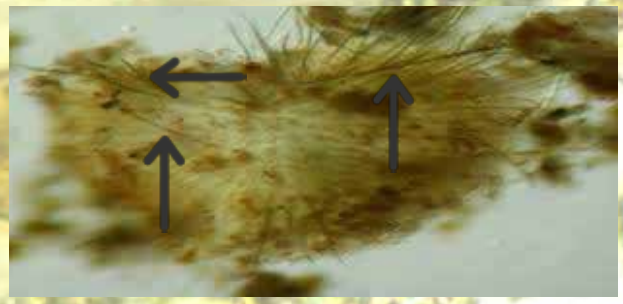
With increasing light and temperatures, the akinetes start to germinate and spend several weeks in the lake sediment absorbing nutrients and growing. The akinetes undergo a high level of cellular division and develop into new *Gleo* colonies.

Summer

When the new *Gloeo* colonies are fully mature, they float to the lake's surface using gas bubbles stored within the colony. An algal bloom is observed when millions of *Gloeo* colonies simultaneously migrate to the lake surface. Because *Gloeo* colonies are very buoyant, wind often pushes colonies inshore. Occasionally, *Gloeo* colonies will wash up on land during a bloom, and resemble pollen. They will spend a few weeks at the lake's surface and will divide into new colonies until their internal nutrient reserves dwindle.

Autumn

As light and warm temperatures decrease in September, a *Gloeo* colony on the lake surface will produce special cells called akinetes before dying. One parent colony can typically produce up to 500 akinetes. These akinetes remain within the parent colony after it dies and sinks to the lake bottom. Akinetes are able to withstand periods of extreme temperatures as well as desiccation, an evolved trait that allows *Gloeo* to survive in a lake year to year.



The arrows point to rod-like akinetes germinating from a dead parent colony under a microscope.