

GIANT LYNGBYA

by David R. Bayne

Blue-green algae are primitive microorganisms that are more closely related to bacteria than to other algal groups (e.g. diatoms or green algae) and thus their scientific name Cyanobacteria. Like other algae their cells contain the green pigment, chlorophyll a, and they produce their own food through the process of photosynthesis using light energy and inorganic nutrients. However, beyond that there are few similarities. For example, blue-green algae are virtually non-motile and are incapable of sexual reproduction, unlike most other algal groups.

Lyngbya is a filamentous Cyanobacteria composed of a single series of cells surrounded by a tough covering or sheath. These hairlike strands or filaments can vary in size and length and may be crowded together in thick, tangled mats or occur individually suspended in the water (phytoplankton – see Blue-green Planktonic Algae, Southern Ponds, Fall 2004). There are over 60 different kinds of Lyngbya most of which live on bottom substrates in fresh, brackish and marine waters. Most of the freshwater forms are not troublesome, consisting of relatively small mats of fine, soft filaments resting on the bottom or occasionally floating at the surface. However, in the mid to late 1970's a new, noxious form of Lyngbya began to appear in southeastern ponds and lakes. This lyngbya was huge, with filaments 6 to 10 times the diameter of most other freshwater forms and exhibited extremely aggressive growth resulting in literally tons of plant material per surface acre of water. Although there is still some debate as to the correct scientific name (most frequently referred to as Lyngbya wollei) the common name, giant lyngbya, is well known among aquatic resource managers and pond owners in the Southeast.

Figure 1. Giant lyngbya floating on the pond surface



In terms of aquatic weeds, giant lyngbya is a pond owners nightmare. In the first place the alga thrives in warm, slightly alkaline waters with abundant nutrients. Most managed ponds receive periodic applications of lime (an alkaline agent) and fertilizer to improve fish production. Giant lyngbya begins growth on the pond bottom down to relatively deep depths (about 6 feet) in late winter and early spring. As the water warms in late spring and summer, the thick bottom mats trap gas produced during photosynthesis and float to the pond surface (Figure 1). By the time a pond owner notices giant lyngbya floating at the surface, it already has a head start growing on the pond bottom. Wind can blow the algal mats around forming thick blankets of plant material that block sunlight penetration into the waters below. These mats may persist for several years.

Giant lyngbya has few redeeming qualities. It interferes with practically all uses of a pond particularly recreational uses like fishing, swimming and boating. The plant hordes nutrients and prevents their use in the pond's food web that would otherwise benefit fish production. Reduced sunlight penetration into the water under the algal mats can degrade water quality (e.g. decrease dissolved oxygen) and threaten fish health. Lyngbya produces volatile organic compounds that enter the air, water and fish and impart musty/fecal odors around the pond and off-flavor to water and fish. In 1997, samples of giant lyngbya collected in Alabama waters were found to produce a potent, acutely lethal neurotoxin when tested in mammals. The ramifications of this in southeastern ponds is not at all clear but certainly is not a good thing.

Now that you have heard the bad news, here is the worst news! Giant lyngbya is almost impossible to control with the present physical, chemical and biological tools available for use in waters where fish are grown for human consumption. Copper compounds and diquat, two contact algaecide have been used with limited success both individually and in combination. The addition of certain adjuvants that help to hold the herbicide in contact with the plant mass can improve results. A relatively new algaecide, peroxyhydrate, has also been used with some success. However, the thick sheaths that surround the cells in the filament, the massive mats that prevent penetration of herbicides to underlying layers and the fact that a large portion of the plant biomass may be on the bottom of the pond, result in only partial control of the lyngbya with herbicides. Grass carp do eat giant lyngbya and have had varying levels of impact on infestations. The most success with grass carp has occurred in ponds with little else for grass carp to eat but lyngbya. Mechanical harvesting of lyngbya is extremely expensive, may spread the plant (i.e. fragmentation) and does not affect lyngbya growing on the bottom.

Fortunately, there is research underway that looks promising at this stage and may result in an effective means of managing this noxious weed sometime in the future.

What should pond owners do? If your pond does not have giant lyngbya, prevention is the key. Steps that might help include:

1. Eliminate shallow (<2.5 ft) water areas;
2. Begin fertilizing the pond early (January in south Alabama and February in north Alabama) to shade pond bottom and prevent establishment of lyngbya (lime pond if necessary to get a bloom);
3. After fishing in other waters, always clean fishing tackle and boating equipment before using in your pond;
4. Early detection is important. Seek professional help in identifying bottom or floating mats of algae. Giant lyngbya mats usually appear black, are fibrous and tough to tear apart;
5. Stock grass carp at 5 fish/surface acre in new ponds or older ponds with few submersed weeds. Higher rates should be used in weedy ponds. Restock when weeds appear but at least every 5 years.

If, despite your best efforts, giant lyngbya becomes established in your pond, you should:

1. Seek professional help immediately. Early intervention can improve the chances of successfully managing an infestation;
2. Use an integrated management approach involving fertilization (as mentioned above), repeated applications of algaecides and increased stocking densities of grass carp.