Test results are back - Algae identification March 29, 2009

We suspected that some kind of Algae bloom is responsible for the brown color of our lake water. A couple of weeks ago I sent a sample off to Bill Cody to be tested. Here is what I found out.

Algae identified: The algae that is causing the brown water is a diatom of a genus called Achnanthidium. The official name is **Achnanthidium minutissimum**. You can Google the name for more information about it. A Google of Achnanthes minutissima (old name) will also reveal lots of info about this particular algae.

Color: It is a golden brown algae and that is the reason for our brown water color.

Density: The Lake Vilbig sample contained 1,135,956 suspended Achnanthidium minutissimum algae per milliliter. Its density was 939,120/ml which comprised 82.7% of the sample. That is a lot and any water with this algae of that density is going to give the water a brownish appearance.

Other particles in sample: The suspended detritus (mostly very small organic particles) was also pretty abundant. Estimates were for 0.1-1um dia 7,672,000/ml and 1-5um dia 1,953,000/ml. um = micrometrers. There are 1000 um per 1 millimeter.

What is odd about the Lake Vilbig sample? Bill Cody said Achnanthidium minutissimum is typically not a planktonic species but it is blooming with a planktonic growth pattern in our lake. Normally this species grows attached to all sorts of underwater substrates and it often grows in groups.

Bill also said that when this algae blooms in open water planktonic style, it is because the lake water is well oxygenated (a good thing).

Pictures of our samples

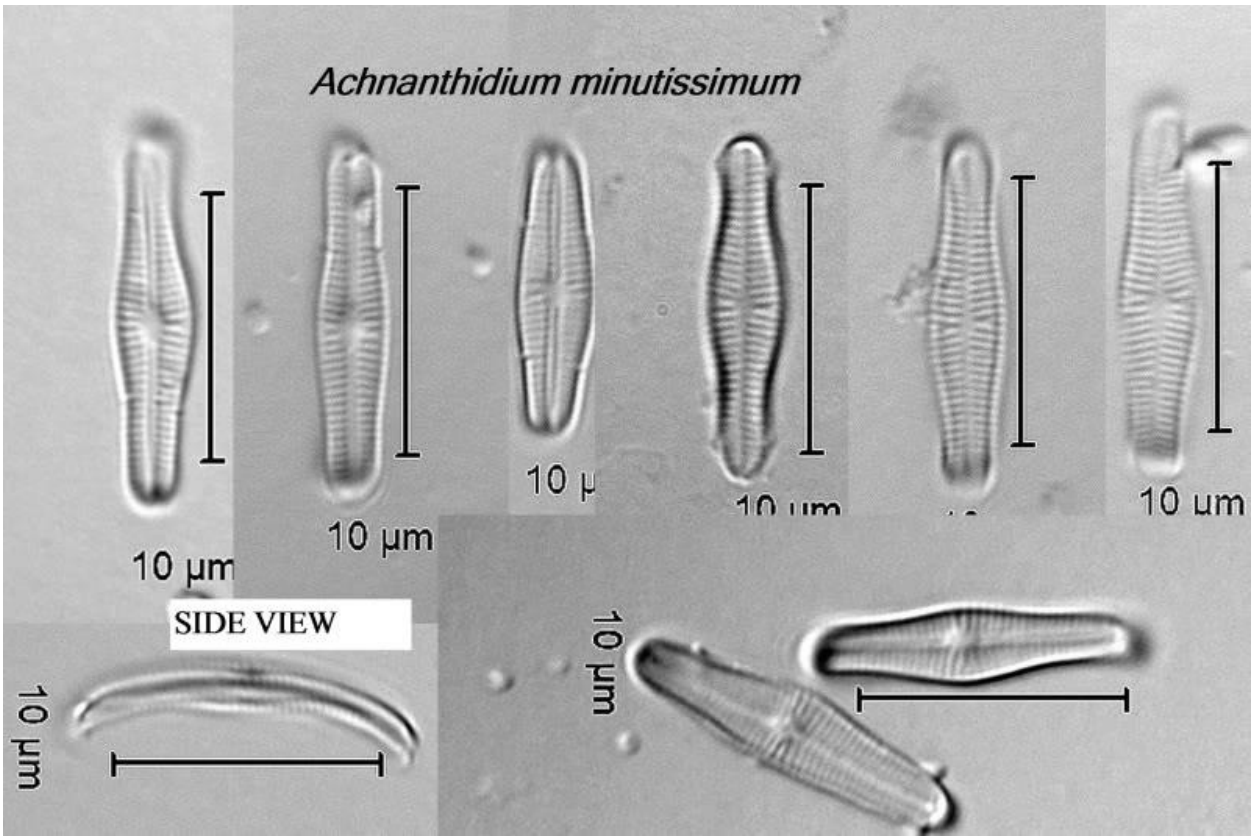
Vilbig water sample picture 1:
This picture is of our water sample through the microscope. You can see that about the only thing in the field is Achnanthidium minutissimum. It definitely dominated our sample. You can also see that the cells were pretty much all separate with planktonic growth patterns.

http://i257.photobucket.com/albums/hh212/lake_vilbig1/misc%20pictures/algae/pic1-vilbigsample.jpg

Vilbig water sample picture 2:

The algae samples were cleaned and mounted. This is a composite plate containing several pictures of our diatoms taken at 1000X. Cody said that their small size and the fine striae (lines on the shell) made the diatoms hard to photograph.

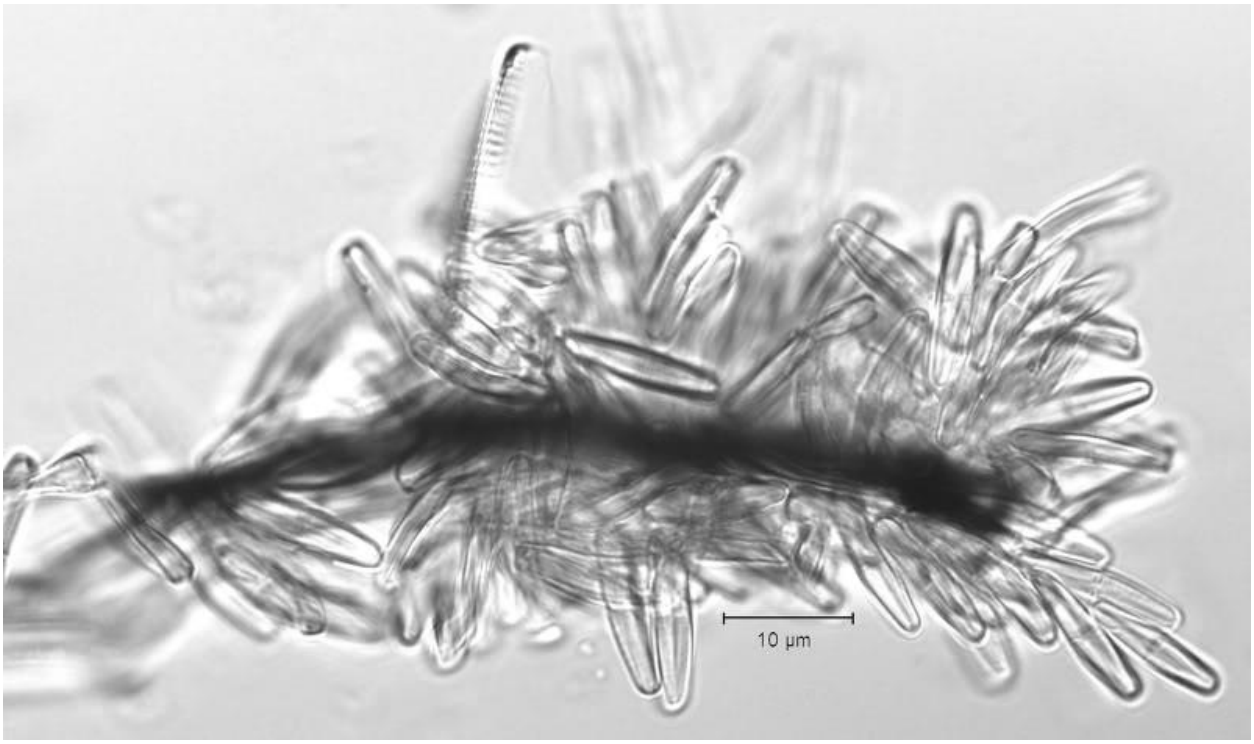
http://i257.photobucket.com/albums/hh212/lake_vilbig1/misc%20pictures/algae/pic2-vilbigcompositeplate.jpg



Example picture 3:

This picture is taken from another sample not on Lake Vilbig. It shows the typical growth pattern which is attached to a strand of filamentous algae.

http://i257.photobucket.com/albums/hh212/lake_vilbig1/misc%20pictures/algae/pic3-notvilbig.jpg



Bill said that he has never seen Achnanthidium minutissimum so abundant in the plankton. It was readily reproducing since he saw lots of individuals paired which is a stage of asexually reproducing.

I talked with Meridith Byrd from the HAB Response Coordinator at the Texas Parks and Wildlife. She thinks something caused this species to gain an advantage over other algae in the lake and now it is reproducing at a very high rate.

The alga is not harmful or toxic. As with any algae, eventually the population can get so dense as to use up all the available oxygen in the lake (I think we are very far from that).

What's next?

We will continue to watch the lake and investigate what might be causing the bloom.

There has been no harm or problems that have resulted from this algae that we know of right now. I am sure it will be on the agenda of the next board meeting and environmental committee meeting. This algae should eventually go away.

Additional information about the test

Bill Cody - I met Bill on the Pond Boss message board a couple of years ago.....known as the "Pond Doctor." Bill has a master's degree in aquatic biology from Central Michigan University. He is an Algal & Invertebrate Taxonomist and owns and manages a company that identifies and counts aquatic organisms. He is the moderator on the Pond Boss Internet forum dealing with pond management questions (http://www.pondboss.com/forums/). His address is 203 South Turkeyfoot | Box 64 | Malinta, Ohio 43535

Genus - Genus is a category of biological classification that ranks between the family and the species and contain related species. Species is a category of biological classification ranking just below the genus or subgenus and comprising closely related organisms potentially able to breed with one another. http://en.wikipedia.org/wiki/Genus

Diatom - Diatoms are photosynthesising algae, they have a siliceous skeleton (frustule) and are found in almost every aquatic environment including fresh and marine waters, soils, in fact almost anywhere moist. They are non-motile, or capable of only limited movement along a substrate by secretion of mucilaginous material along a slit-like groove or channel called a raphe. Being autotrophic they are restricted to the photic zone (water depths down to about 200m depending on clarity). Both benthic and planktic forms exist. A characteristic feature of diatom cells is that they are encased within a unique cell wall made of silica (hydrated silicon dioxide) called a frustule. These frustules show a wide diversity in form, some quite beautiful and ornate, but usually consist of two asymmetrical sides with a split between them, hence the group name. http://en.wikipedia.org/wiki/Diatom

How the sample was prepared - Water containing the algae was placed in a 2-oz plastic bottle with a screw cap. ½ teaspoon of Providone-Iodine 10% (a generic Iodine based skin cleanser from CSV pharmacy) was added to the sample to preserve it. This turned the sample a light yellow, whiskey or amber color.

How much did it cost to have the sample looked at: Bill Cody charged me $25.00. There was a small shipping cost, and the Iodine cost $12 (8 ounces).