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Nature Notes: It Started With Algae

We owe our existence to these little filamentous blue-green cells

By Larry Penny | October 15, 2015 - 12:57pm

As Roseanne Roseannadanna of "Saturday Night Live" might say if she were with us today, "What's all this fuss about blue-green algae? Algae are good, aren't they?" Yes, blue-green algae have become common in the news lately. But I doubt that one in 10,000 people have ever seen one or has any idea about what one is. In actuality, the blue-green alga is not an alga at all (true algae have nuclei), but a bacterium, in fact, a cyanobacterium, one of the first to exist on earth.

There are fossil things that are called stromatolites and oncolites that date back to the dawn of life. A few of these are so large that they form "reefs" visible to the naked eye from a half mile away, such as those in Shark Bay in southwest Australia or the Bahamas. The cells secrete a mucous material that traps sand grains and detritus around them, binding them together and creating a larger and larger resilient mass over thousands if not millions of years.

We should know about this group of bacteria because if it weren't for them, we wouldn't be here, nor would the million and more other species in the Kingdom Animalia. Perhaps, as long as more than 3 billion years ago, or at least 2.4 billion years ago, according to the fossil record, when the atmosphere contained almost no oxygen, they were here absorbing carbon dioxide and using their greenness to turn it into carbohydrates, while releasing oxygen as a gaseous waste product. Our first fossils were cyanobacteria.

We owe our existence to these little filamentous blue-green cells, yet we know so little about them. They occur all over the world, mostly in fresh waters, and are generally harmless. Perhaps that's why we've studied them so little. Yet, we have almost all seen them in our local streams, ponds, pools, and puddles. Most of us know them as "pond scum," the slimy malodorous stuff that occasionally takes on the appearance of a noxious film across the surface of the water.

Blue-green algae can be nutritious, like other greenstuffs, as well. At least one company, New Earth, farms them and markets them in the form of several different health food products. But all of a sudden they are gaining a very nasty

reputation, not only here, but all over the United States and the rest of the world. One newly invasive species, Cylindrospermopsis racibarskii, is particularly troublesome.

On a place with the inviting name of Palm Island off the coast of Queensland, Australia, in 1979, this species not only fouled the water but poisoned more than 100 adults and children who drank it. Normally, it does not cause a problem, but the waterworks handlers there made the mistake of using copper sulfate to kill it, as it was clogging pipes and filters in a big way. Well, it turns out that the worst kind of control method to remove blooms of this algae is to kill it with chemicals, as it releases poisons in its death throes, poisons that are normally used to render it inedible to fish, zooplankton, and others that feed at the bottom of the food chain.

It's only in the last two years that blue-green algae have caused a stir locally, especially in coastal water bodies like Agawam Lake in Southampton Village, Mill Pond in Water Mill, Georgica Pond in East Hampton, and, now, Fort Pond and Big Reed Pond in Montauk. When conditions are right, these organisms multiply by cell division, doubling several times a day; two produce four, four produce eight, and so on. The right conditions include an ample supply of nutrients, particularly nitrogenous and phosphorous ones, low oxygen, still water, and little rainfall.

The above-mentioned ponds receive runoff and groundwater underflow laden with all kinds of chemical stuff that produces a soup harmful to fish and other aquatic animals, but nutritious to blue-green algae. So if we don't clean up our act — and as a species we are far from doing that — those little microbes that one can't see individually with the naked eye but only in an ungodly, ugly slimy mass, those microbes that gave us life to begin with, might take it away. The invasive one I referred to came from the tropics, so as we become more and more tropical under the pall of global warming, watch out!