ENVIRONMENT

Blue Bacteria in Bloom

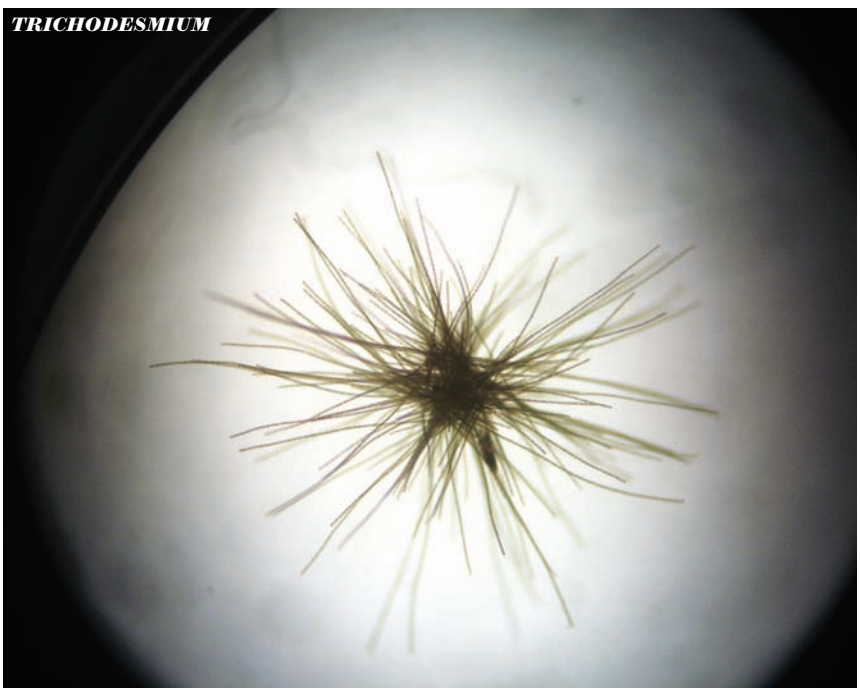
The proliferation of cyanobacteria in oceans may accelerate warming

On their own, cyanobacteria are tiny photosynthetic organisms floating in the sea. But when they join forces, linking together into chains and then mats by the millions, they can become a threat. Before long, the bacteria change the color of the sea's surface and even soften the wind-tossed chop. One study of cyanobacteria, also known as blue-green algae, although they are not algae, predicted that rising sea temperatures could help the already widespread creatures expand their territory by more than 10 percent. Now researchers are asking whether mats of cyanobacteria might themselves affect local sea temperatures, thus creating a powerful feedback loop.

Cyanobacteria are ubiquitous. They spew enough oxygen into the atmosphere to dictate the current mix of gases we breathe. They also compete—with great success—for nutrients such as nitrogen and phosphorus. When cyanobacteria bloom, it is often at the cost of neighboring species such as fish or other phytoplankton. So if cyanobacteria are shaping the temperature of their growing patch of the ocean to favor themselves over cold-water critters, researchers want to know how they are doing it and what to expect next, says climate scientist Sebastian Sonntag of the University of Hamburg in Germany.

Sonntag and his colleagues have adapted a computer model that describes the mixing of layers of seawater to take into account two kinds of changes produced by the cyanobacterium *Trichodesmium:* more light absorption and less choppy waves. The updated model predicted sea-surface warming of up to two degrees Celsius because of light absorption. The wave dampening appeared to affect local temperatures by about one degree C.

This may be the first such study of algal blooms in the ocean, says aquatic microbiologist Jef Huisman of the University of Amsterdam, who has studied light absorption by cyanobacteria in lakes. Both Sonntag and Huisman say they would like to ask oceanographers to measure seawater temperature where cyanobacteria grow and in nearby empty areas to test the new model's predictions and to improve future versions. *—Lucas Laursen*



TRICHODESMIUM

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