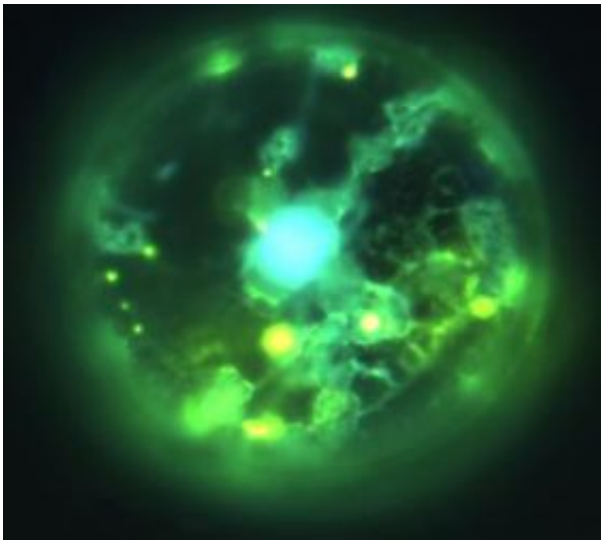
Diatoms discovered to remove phosphorus from oceans

May 2 2008



Georgia Tech researchers found that diatoms naturally remove phosphorus from the oceans. Credit: Ellery Ingall

Scientists at the Georgia Institute of Technology have discovered a new way that phosphorus is naturally removed from the oceans – its stored in diatoms. The discovery opens up a new realm of research into an element that's used for reproduction, energy storage and structural materials in every organism. Its understanding is vital to the continued quest to understand the growth of the oceans. The research appears in the May 2, 2008 edition of the journal *Science*.

Ellery Ingall, associate professor in Georgia Tech's School of Earth and

Atmospheric Sciences, along with Ph.D. student Julia Diaz, collected organisms and sediments along an inlet near Vancouver Island in British Columbia. During their investigation on the boat, Diaz used a traditional optical microscope to discover that diatoms, microscopic organisms that live in oceans and damp surfaces, were storing blobs of very dense concentrations of phosphorus called polyphosphates.

“These polyphosphates have been missed in classic studies because they haven’t been recovered by the typical measurement techniques,” said Ingall. “No one measured or treated the samples because no one knew they were there – they didn’t even think to look for it.”

For a long time, scientists have been unable to account for the difference in the amount of phosphorus that’s in the oceans and the amount that’s washed in from rivers.

“We’re getting the initial clues as to how this phosphorus gets to the bottom of the oceans,” said Diaz. “These diatoms are sinking from the top to the bottom of the ocean, and as they’re sinking, they’re transporting the phosphorus in the form of intracellular polyphosphate.”

After making their initial discovery, the team made another. They went to Argonne National Laboratory near Chicago to delve deeper and found that some of the blobs were polyphosphate, some were a mineral known as apatite, and some were a transitional material between the two.

Now that they’ve proved a link between polyphosphate and apatite, they’re next step is to try and capture the chemical transition between the two by running controlled experiments in the lab.

Source: Georgia Institute of Technology