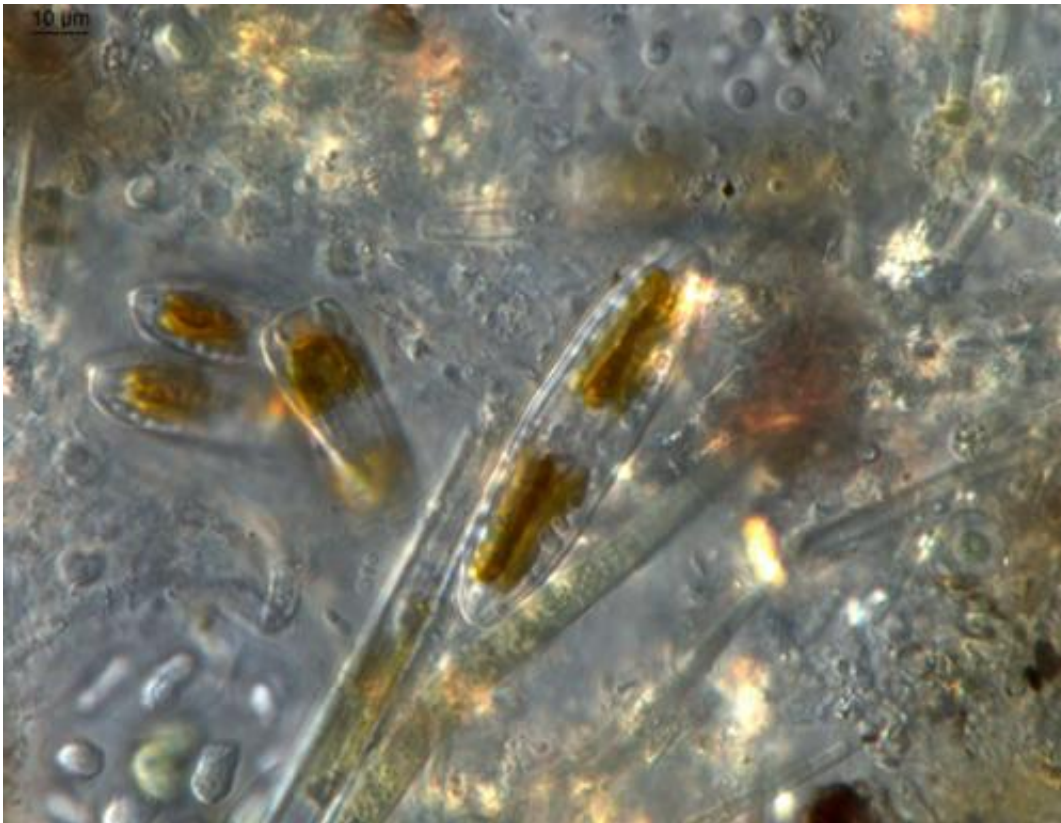


Ph.D. student names three new algae species in the Everglades

September 11 2013, by Evelyn Perez



A view of a live *M. calcarea* sample through a light microscope.

Sylvia Lee never intended on finding, let alone naming, three new species of algae in the Florida Everglades.

Lee, a biological sciences Ph.D. student in FIU's [Florida Coastal](#)

[Everglades Long Term Ecological Research \(FCE LTER\)](#) program, was looking at samples of diatoms, or [microscopic algae](#), as part of her doctoral dissertation. Lee's dissertation focuses on how diatom communities in the Everglades have changed over time and space in response to water management and [climate variability](#). Diatoms are unique due to the distinct ornamentation on their cell walls and the fact that the walls are made of silica, the main ingredient in sand and glass.

"The general plan for Everglades restoration is to change the quantity and timing of waterflow," Lee said. "Since diatoms are the first responders to environmental change – and because their populations are large and generate relatively quickly – they're great indicators of conditions in aquatic systems."

Discovery and naming

The first [species](#) Lee named is *Mastogloia calcarea*, an algae that thrives in freshwater and is abundant in the Everglades and parts of Jamaica, Belize and Mexico. It had previously been identified as another species, *Mastogloia smithii*, in England in 1856. However, the cell traits – including length, width, shape and other [cell wall](#) features – did not fit the descriptions of *M. smithii* that is currently in taxonomic reference books.

The second species is *Mastogloia pseudosmithii*, a rare form of algae that prefers brackish, or salty, environments. This species had previously been confused as *M. smithii* due to its similar shape, however, Lee found that its shape and cell wall striation patterns do, in fact, differ.

The third species Lee named, by chance discovery, is *Envekadea metzeltinii*. Lee sent samples of *M. pseudosmithii* to a colleague, Bart Van de Vijver of the National Botanic Garden of Belgium, for 3D picture analysis. Van de Vijver found a new, unnamed species within the

sample. Together, the two researchers named the species after Ditmar Metzeltin, a diatomist who had found and described the diatom in 2007 but never named it. This rare species thrives in saline environments and has been observed in similar wetlands in the Yucatan. It is unique in that the cell wall has a thin covering over the pores, thus distinguishing it from most other porous diatoms.

"It's important to have the correct name for each species, particularly when you want to make accurate comparisons of biodiversity found in different locations across the world," Lee said. "These global comparisons are what you use to answer questions about climate change and other large-scale phenomena.

"Also, as the environment changes and humans continue to impact the natural environment, it's always possible we might lose some of these species. So it's important to accurately document them before they're lost."

Algae produce 70-80 percent of the world's oxygen, remove carbon dioxide and are the base of the food web in aquatic systems. There are estimates of a million algae species on the planet, but only 30 percent of them have been described and named. In the Everglades, algae are studied to detect environmental changes due to pollution, water management projects, sea level rise and damage from storms.

"Not many students have the opportunity to name species during their degree program because it takes a long time and requires a great deal of connections with other taxonomists around the world," said Evelyn Gaiser, lead primary investigator of FCE LTER and Lee's major professor. "Naming a new species requires a deep understanding of the diversity of related species and an eye for difference. Sylvia is a special researcher for her deep-rooted love for algae and her commitment to her field through careful research and inspired training."

Lee's first two findings are reported in a paper, "Morphology and typification of *Mastogloia smithii* and *Mastogloia lacustris*," and will soon be published in the scientific journal, *Diatom Research*. The paper documenting Lee's the third finding is titled "Envekadea metzeltinii sp. Nov., a new [diatom](#) species from subtropical karstic wetlands of the Florida Everglades," and has been published in the research journal, *Phytotaxa*.

Provided by Florida International University

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