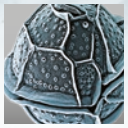





http://www.wilmingtonbiz.com/insights/daniel_g_baden/unique_algae-growing_device_earns_uncw_global_attention/1446

Education Nov 4, 2016

Unique Algae-Growing Device Earns UNCW Global Attention

Sponsored Content provided by Daniel G. Baden - Executive Principal, Marine Biotechnology in North Carolina (MARBIONC)

Marine science researchers in Wilmington, along with one of our private-industry partners, have attracted favorable attention to UNCW's marine science research and begun generating sales of related commercial products.

All that came as a result of presentations made during a recent international conference. Two MARBIONC staff members attended the 17th International Conference on Harmful Algae in Florianopolis, Brazil earlier this month. They made presentations about recent discoveries made by UNCW marine biologists, our collection of marine algae samples and cultures and a unique device developed here at CREST Research Park.

That machine - a photobioreactor - allows researchers to grow algae in larger quantities, under better controlled conditions and faster than previous methods allowed.

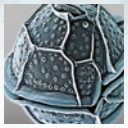
The biennial conference focuses on single-celled organisms that can lead to major fish kills, make seafood toxic and cause paralysis or organ failure in humans. Among the best known of these harmful algae are those that cause red tides from time to time along the Atlantic seaboard. But the effects of harmful algae are far more widespread, and they are a matter of serious concern worldwide for fisheries and human health.

The five-day conference drew more than 500 people from all over the world. UNCW representatives Sara Karafas and Alexis Marti were among hundreds who made presentations about their work. Some of these were 20-minute formal talks before an audience, while others were smaller conversations about information displayed on detailed posters, which illustrate specific aspects of research projects. The poster sessions tend to be especially useful, participants say, because they can look closely at the details, ask questions and interact one-on-one with the presenters.

Karafas - who holds a master's degree in marine science from UNCW and now works as the "culture curator" at MARBIONC – gave a talk about two newly described species of harmful algae. They are from the same biological genus but are genetically very different and come from opposite sides of the globe - one from Palmyra Atoll in the Pacific; the other, the Virgin Islands. Both produce toxins that cause harm to the cells of mammals, including humans. "We got some interest in collaborations," from scientists across the globe, Karafas said.

She said these international meetings are good for bringing together scientists who are working on related topics but otherwise might never connect. Marti, also a UNCW marine science graduate, is now working as a research technician through an IKA-Works fellowship. Based in Germany, the company's U.S. headquarters is here in Wilmington. IKA-Works, a manufacturer of scientific and analytical equipment, is collaborating with members of our faculty to develop the photobioreactor.






http://www.wilmingtonbiz.com/insights/daniel_g_baden/unique_algae-growing_device_earns_uncw_global_attention/1446

Marti and an IKA-Works representative led a photo presentation and displayed an example of the machine, which drew a strong, positive response from the international audience.

Calling it an "example of translational research," Dr. Carmelo Tomas said it showed collaboration "with local industry to produce something that's now on the market." Tomas, a marine biology professor, directed the UNCW team that attended the Brazil conference.

Before IKA's work to commercialize the new device, researchers grew algae in 12 liter bottles called carboys – familiar to home-brewers and winemakers – that took up large amounts of lab space. The light needed to make the algae grow came from old-fashioned incandescent bulbs, unlike the photobioreactor's precisely color-controlled LEDs. It was difficult to control all the necessary conditions, which kept output low and made some species almost impossible to culture in useful amounts.

Now, however, the machine "can grow very sensitive species under controlled conditions, and produce a large amount of biomass material," Tomas explained. This is important for working with toxic algae because while they contain potent toxins, the significant molecules make up a very small proportion of the organism's total mass. Hence, lots of cells must be grown to acquire enough material for useful experimentation.

With the 10 liter unit that IKA is now marketing, a researcher can grow 10-100 times more algae in a 2x2 foot square "footprint" than was possible in a much larger space using the old culture-in-a-bottle system. "We have been able to create a ten-fold increase in biomass, which is crucial for science and industry," Marti said at the conference, emphasizing the versatile machine's ability to create optimal growth conditions for different species.

It allows you to change a variety of parameters, Tomas said, including the amount and quality of light, the temperature and water chemistry. To minimize unintended reactions from metal or plastic parts that might release stray molecules into the water samples, the machine uses entirely "inert" materials like glass, Teflon or special non-reactive surgical-grade plastics. "We're able to grow species – poorly studied or important species – that can't be grown in any other way," he said.

As a result of Marti's presentations, there is now interest in our machine from scientists in the United States, Europe, South America, Japan and the Middle East. IKA-Works is now following up with conference attendees who asked for more information about the device.

Here at home, we are making good use of the photobioreactor to grow commercially useful quantities of important algae species, which we offer for sale in various forms. The result is a new commercial resource called the Algal Resources Collection. It makes scientifically interesting cultures - in quantities large or small - available to scientists anywhere.

Through their presentations, Karafas and Marti called our collection to the attention of the world's scientists. We have already made a sale to Japanese researchers as a direct result of our team's appearance at the conference. Early results from the algae conference demonstrate that institutions like UNCW and MARBIONC can play an important global role, not just in advancing scientific knowledge but also in promoting the commercial development of academic research.

UNCW CREST Research Park is a frontrunner in marine biotech research and development. Researchers are exploring the potential of natural products derived from the sea to treat or cure human diseases and meet other important needs. Discover why rising biotechnology and life sciences groups from all over the country are moving to CREST. UNCW CREST Research Park offers top-notch commercial laboratories available for lease at affordable rates, flexible terms, and innovative product development opportunities that are unmatched by any other park. Connect with CREST at crest@uncw.edu today.