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UVI efforts could lead to safer meals for fish lovers

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University of the Virgin Islands researchers are collecting samples of plants, algae and fish in an attempt to understand ciguatera poisoning.

ST. THOMAS - A grant from the National Oceanic and Atmospheric Administration will allow a group of local scientists to continue their research to study the causes of ciguatera fish poisoning.

Tyler Smith, of the Center for Marine and Environmental Studies at the University of the Virgin Islands, was awarded \$573,225 of a \$4,015,370 five-year grant to investigate the environmental controls of ciguatera fish poisoning in the Caribbean - focusing on the Virgin Islands.

The grant was awarded by NOAA's Ecology of Harmful Algal Blooms program.

In December 2009, UVI researchers partnered with Woods Hole Oceanographic Institution, Schneider Hospital, the Food and Drug Administration, Dauphin Island Lab and Florida State University for a wide-ranging study on ciguatera.

The new NOAA grant will continue the sampling in St. Thomas waters, but will also start sampling in other areas of the Caribbean. Smith will focus on the Virgin Islands, and principle investigator Michael Parsons of Florida Gulf Coast University will lead the collection of reef and fish samples in the other locations.

"We're really trying to take a much larger view, while continuing our focus on St. Thomas because it's become one of the most important data sets on ciguatera fish poisoning in the world," Smith said.

The sampling method developed by Smith and his students will be the framework used by Parsons for the new sampling areas.

"Ciguatera is of great concern to people who prefer or depend on reef fish in their diets," Parsons said in a written statement. "Anything we can do to lessen illnesses by reducing the exposure to the toxins that cause ciguatera would be a great benefit to the consumer."

The ciguatera research in the territory will push science and health forward on a global scale, Smith said.

"We're going to be finding exciting new things, but it's going to take time to put all the pieces together," he said.

The ongoing project looks at how ciguatera works its way up the food chain, how it affects human health and if climate change or environmental factors contribute to higher or lower instances of poisoned fish. Smith and the



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UVI Center for Marine and Environmental Studies have been working on collecting samples from local coral reefs and fishes, and the new grant will allow that sampling to continue.

Ciguatera poisoning is caused by naturally occurring toxins, called gambiertoxins, that are produced by microscopic plants - gambierdiscus toxicus - that live on seaweed and other surfaces within coral reef communities. When fish eat seaweed or algae they consume the organisms, too. The fish turns the gambiertoxins into ciguatoxins, which build up in the fish's flesh.

The toxin is fat soluble - it is stored in the fish's body and not excreted - so it builds up as it goes up into the food chain. The bigger fish eat the smaller fish, and the toxin gets passed on until it is consumed by humans.

Predators at the top of the food chain - such as barracuda - can end up with large amounts of the toxin in their flesh. No test can be done to determine if the fish is poisoned, and cooking and preparation methods have no affect on the toxin.

Smith and his students at UVI's Center for Marine and Environmental Studies have been collecting samples of plants, algae and fish at four sites on a monthly basis and sending them to the project's investigators for analysis. The four sites are Black Point, Flat Cay, Benner Bay and Seahorse.

"We look at what's growing on the reef," Smith said. "Are the coral healthy, are they getting sick, are they loosing color?"

The students also collect samples to see how many gambierdiscus are living on the reef and the toxicity of the cells.

The samples are sent to a lab at Woods Hole for analysis.

"We're also collecting fish, not every month, but every two or three months, to get a good snapshot of the toxicity on the reef," Smith said.

They collect reef grazing fish, such as parrot fish and surgeon fish as well as predators, such as lionfish, groupers and snappers.

Initial results showed that 20 percent of grey snapper were toxic, Smith said. Local fishermen have learned this from years of experience and never sell grey snapper, he said.

"The fishermen are really trying to get out there and protect the consumers," Smith said. "They are considered a 'hot fish,' and people don't touch them at least on the south coasts of St. Thomas and St. John."

The researchers also take environmental samples like water temperature, water quality, and water chemistry - how much dissolved oxygen is in the water.

The data is still being analyzed, but preliminary findings show there may be a link between the abundance of microscopic plants which produce ciguatoxins and the seasonal fluctuations in water temperature.

"The gambierdiscus seems to be most abundant in the warm season, and that seems to be when the sicknesses occur," Smith said. "But this is something that we're still actively researching."

The original ciguatera project that began in 2009 looked at the reef for evidence of ciguatoxins in the Virgin Islands, as well as at the fish poisoning as it presents itself in people admitted to Schneider Hospital. When cases of ciguatera poisoning come into the emergency room, doctors ask patients to participate in the study to provide information for the scientists. They also try to collect actual samples of the poisoned fish for testing.

The larger project's grant - primarily funded by the CDC - will end Sept. 30.

While the new NOAA grant will continue and expand the reef study, no funding has been secured to continue the health project.

"We're stabilized in terms of environmental sampling, but we really want to secure the funding to continue the human health part," Smith said.

The territory's ability to get these types of large grants is a credit to the university's commitment to the Center for Marine and Environmental Studies, which is becoming a major player in the field of marine science research, according to Smith.

"UVI gives us the resources to apply for the grants and makes us a more attractive partner," Smith said.

The Lana Vento Charitable Trust provided the center with specialized equipment - such as boats and laboratories - that are necessary to build capacity and compete on a national level for funding.

Smith said the UVI Center for Marine and Environmental Studies has more than doubled the amount of research grants in the last five years.

For more information about the ciguatera research project visit www.CaribCATCH.org.

- Contact reporter Aldeth Lewin at 714-9111 or email alewin@dailynews.vi.

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