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Ventura students work with rare fish samples

By Cheri Carlson
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Oarfish
This oarfish washed up on the beach near Oceanside in October, days after another oarfish was found off Catalina Island

Ami Ballmer
Claire Jurgensen (left) and Ami Ballmer, who attend Foothil Technology High School, work at Coastal Marine Biolabs to generate DNA barcode data from oarfish tissue samples. Their work will be published in a global scientific database.

Claire Jurgensen
Ami Ballmer (left) and Claire Jurgensen, students at Foothill Technology High School in Ventura, add an enzyme to a tissue sample at Coastal Marine Biolabs in Ventura Harbor. They are working to generate DNA barcodes from rare oarfish tissue samples.

Silica Spin Column
A silica spin column is used to purify the DNA

Ralph Imondi
Dr. Ralph Imondi, scientific co-director of Coastal Marine Biolabs, works with Ballmer in the lab.

Linda Santschi
Dr. Linda Santschi, scientific co-director of Coastal Marine Biolabs, discusses the significance of the students' barcoding efforts.

Inside a Ventura Harbor lab, two 17-year-olds pored over tiny tissue samples of a rarely found fish.

Working with the nonprofit Coastal Marine Biolabs, students from Foothill Technology High School joined scientists for a chance to study two rare oarfish specimens. The two giant, snakelike fish washed up on the Southern California coast within a few days of each other in October.

We know very little about the life history of these fish," said Dr. Ralph Imondi, co-director of Coastal Marine Biolabs at the Ventura Harbor. "One of the key things we don"t know is: Are they one or multiple species?"

The students working with the lab will help generate a genetic barcode for the two oarfish in the span of a week. The information will be added to a worldwide database called the Barcode of Life Data Systems (BOLD). BOLD is the data repository for the Internatinoal Barcode of Life (iBOL) project, a landmark scientific effort to barcode all multicellular life on the planet.

"Right now, DNA barcode data exists for only one oarfish specimen in the world," said Dr. Linda Santschi, co-director of the nonprofit lab. Two more specimens will not definitively answer the multiple-species question, but it will be a significant step forward, she said.

On Oct. 13, an 18-foot-long oarfish was found off Catalina Island. Days later, a second oarfish washed up on an Oceanside beach. What happened before they ended up dead off the coast, however, is a mystery.

Two oarfish have washed up on the same beach at the same time several times elsewhere, said Dr. Milton Love, a research biologist at the Marine Science Institute at UC Santa Barbara. But in Southern California, if not unique, it is very unusual, he said.

The oarfish may have been traveling together off Southern California, maybe as part of a larger group.

"Something untoward happened. They wound up in shallow water," Love said.

Oarfish live deep in the ocean, where conditions are calm and quiet. They do not seem to be very good swimmers and likely cannot survive in the more turbulent shallow water, he said.

Little is known about the fish, which have a bluish, silvery body and scarlet red fins. It's so different from most other fish, and having samples that are not decayed is rare, Love said. Scientists lined up for a chance to study the specimens.

Including students in authentic research was what Imondi and Santschi envisioned for the lab. They established the nonprofit in 2006, wanting to change the way science was taught by bringing students, teachers and scientists together to participate in landmark research.

After the lab was built, students were first accepted in 2008. In the years since, students and teachers from throughout California and more than a dozen other states have participated in CMB

programs. The bar coding project is funded with a grant from the National Science Foundation.

Student interns Claire Jurgensen and Ami Ballmer, both 17, recently got to work on generating DNA barcodes for the oarfish specimens. Inside the lab, the pair were quiet and focused. But later, they enthusiastically talked about the opportunity they said was pretty rare for a high school student.

Most of the time, students already know what the results will be when they work in a school lab, Ballmer said. But this time, not even the scientific community knows the outcome.

"Barcoding is real discovery and contributes real data to science," she said.

For more information about Coastal Marine Biolabs, visit http://www.coastalmarinebiolabs.org/index.html.