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Illinois Wesleyan Biologists Hope to Continue Antarctic Research

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BLOOMINGTON, Ill. — Working on the deck of a boat while clothed in layers to protect against minus-4 temperatures; contending with 30-foot waves; trying to sleep while either one's mattress or one's self continually slides around with the boat's motion; trying to work at a microscope with your legs wedged to hold you on your chair—none of this would sound like much fun to the average person.

But Illinois Wesleyan University Associate Professors of Biology Elizabeth (Susie) Balser and Will Jaeckle are fresh from this experience—their second research expedition to Antarctica in three years—and are already looking forward to their chances at another. And next time, they'd like to include students. The rewards of the research far outweigh the difficulties, Balser said.

A *Brachiolaria*, or starfish larva, as seen in a microscope photo.

As with their previous journey, Balser and Jaeckle returned from a month on board the *Research Vessel Laurence M. Gould* with a collection of specimens now living in Balser's IWU lab refrigerator—this time both adult and larval forms of the pterobranchs that form the crux of Balser's work. Those specimens represent the possibility for further research and the hope that, based on this productivity, the biologists can return and continue their work on invertebrate animals found in the ocean and on the sea floor between Antarctica and South America.

Balser has assembled an uncommonly large collection of the bottom-dwelling pterobranchs (hemichordate worms), considered significant for study because they are among the simplest species in the developmental line leading to vertebrates, yet not well-researched because of their small numbers in warmer regions. The creatures are about five millimeters long, with a crown of tentacles Balser compares to a Native American headdress. They come in bright colors of red, orange, yellow and white.

"You don't really notice how beautiful these animals are until you look at them using a microscope. When you use a microscope, the colors just flare," she said.

One of the things she'd like to learn about the organisms is whether the larval forms, which are supposed to live off their "yolk stores" like a chicken egg and not take other nourishment, will actually feed during their prolonged development in her lab refrigerator.

Jaeckle's research also involves nutrition, looking at how the floating larval forms of several species—including various worms and sea stars—absorb and distribute nourishment within their bodies.

"A secondary component of that relates to examining them for morphological adaptations that are related to living in such a cold environment," he said—or whether the cold-water creatures are somewhat different from their warm-water kin in a way that helps them survive the polar environment.

Balser noted that Antarctica has become a "hot spot" for research because of climate change—infamous but all-too-real global warming which is melting glaciers and has the potential to alter ocean currents. The specimens she brought back are living in her refrigerator at 5 degrees Fahrenheit but would die at 8 degrees, she noted.

The biologists' blog about their research expedition is online at http://europa.iwu.edu/news/antarctica/

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