Researcher discovers plankton adjusts to changing ocean temperatures

March 7 2013, by Karin Slyker

(Phys.org) —It was often assumed marine plankton would be easy prey, especially in the dense viscosity of colder waters, but that is not necessarily so.

Imagine trying to swim through a pool of honey. Because of their small size, this is what swimming in water is like for tiny marine plankton. So, it was often assumed they would be easy prey, especially in the dense viscosity of colder waters, but that is not necessarily so.

Texas Tech Associate Professor and Whitacre Endowed Chair in Mechanical Engineering Jian Sheng, along with biologists Brad Gemmell and Edward Buskey from the University of Texas Marine Science Institute, have discovered new information that explains how these tiny organisms overcome this disadvantage.

Their paper, titled "A compensatory escape mechanism at low Reynolds number" was published in the current issue of Proceedings of the National Academy of Sciences.

"The purpose of the study was in trying to determine the effects of climate change at the very base of the food chain," Sheng said.

As one of the most abundant animal groups on the planet, many species, including many commercially important fish species, rely on planktonic copepod nauplii at some point during their life cycle. Understanding the ability of these animals to respond to changes in the environment could have direct implications into understanding the future health of our oceans.

By independently varying temperature and viscosity, Sheng recorded their movements with 3-D high speed holographic techniques developed by the Sheng lab at Texas Tech.

"At 3,000 frames per second, it was like tracking a racecar through a microscope," Sheng said. "We were able to determine that the plankton adapted to changes in viscosity by altering the rhythm of its pulsing appendage."

The response, built-in to its natural muscle fiber, was only triggered by changes in temperature, Sheng said. It could not compensate for changes in viscosity due to environmental pollution, such as algae blooms or oil spills.

Provided by Texas Tech University

Citation: Researcher discovers plankton adjusts to changing ocean temperatures (2013, March 7) retrieved 23 March 2023 from https://phys.org/news/2013-03-plankton-adjusts-ocean-temperatures.html