Woods Hole Oceanographic INSTITUTION

Lateral Line-Mediated Prey Detection in a "Sonar Feeder" from Lake Malawi

Thursday, June 14, 2012
Redfield Auditorium - 12:00 Noon

Dr. Jacqueline F. Webb
Department of Biological Sciences
University of Rhode Island

The mechanosensory lateral line system of fishes detects water flows in a number of behavioral contexts including prey detection. The system is composed of of neuromast receptor organs (composed of hair cells, not unlike those in the inner ear of vertebrates) on the skin and in pored canals on the head and body. Among the four types of head canals found in fishes, “widened” canals are most intriguing – developmentally/morphologically and functionally and as a putative adaptation for enhancing sensitivity to hydrodynamic stimuli produced by prey, which as evolved convergently in a small number of fish families. Most species with widened canals are unaccessible for study (many are deep-sea species), but the peacock cichilds of Lake Malawi (Africa; *Aulonocara* spp.) are easily maintained and reared in the lab and are amenable to experimentation. These fish exhibit an unusual feeding behavior that has led to the assertion that they use their lateral line system to detect prey living in sandy substrates (hence the name "sonar feeders"). Our recent laboratory studies using *Aulonocara stuartgranti* have demonstrated that, in the absence of light, these fish successfully feed on live invertebrate prey (which generate a hydrodynamic stimulus), and that this ability is disrupted when the lateral line system is inactivated. The outcomes of this experiment support the hypothesis that widened canals are an adaptation for enhanced detection of prey (in this case benthic prey), and provide the first evidence for non-visual feeding in cichlid fishes, which are otherwise considered to be highly visual in their behavioral repertoires.