

The Mullineaux Lab: Carly Strasser's Research

Population connectivity of the soft-shell clam

Population connectivity of many marine benthic invertebrates is influenced by dispersal during their planktonic larval phase. This phase is characterized by high mortality, small larval size, and large dilution that make determining larval dispersal challenging. We are investigating the use of environmentally-occurring trace elements retained in the larval shells of bivalves as tags of their natal habitat. We have two objectives: 1) to determine geographically unique trace element signatures for soft-shell clam (*Mya arenaria*) shell material from sites in New England; and 2) to accurately measure the trace element composition of larval shell material retained on a juvenile. Ultimately we may be able to determine whether recruits originated in their site of collection or elsewhere. We are developing a technique using laser ablation to remove particular portions of the juvenile shell for analysis by Inductively Coupled-Plasma Mass Spectrometer (IC-PMS) to assess their chemical signatures. Analysis of shell material from sites with different trace element signatures suggests shell composition reflects the chemical makeup of the water in which it was laid. If shell material from the larval phase can be isolated from a juvenile individual, there is potential for identifying larval origin of settled organisms and assessing connectivity of populations.

Population genetic studies that estimate gene flow are another way to determine whether populations are connected by migrants. We are conducting a pilot study to determine whether variation in the mitochondrial Cytochrome Oxidase I gene can be used to estimate dispersal rates and infer historical biogeography of *Mya arenaria*. These long-term dispersal patterns could then be correlated to short-term patterns seen in our biogeochemical study, and we can determine how they influence one another.

Last updated: April 8, 2011

Copyright ©2007 Woods Hole Oceanographic Institution, All Rights Reserved.

Mail: Woods Hole Oceanographic Institution, 266 Woods Hole Road, Woods Hole, MA 02543, USA.

E-Contact: info@whoi.edu; press relations: media@whoi.edu, tel. (508) 457-2000

Problems or questions about the site, please contact webdev@whoi.edu