ABSTRACT VOLUME

and

FIELD TRIP GUIDE

Characterization of rhodolith beds in the northwestern Gulf of Mexico before and after the BP Deepwater Horizon oil spill

Fredericq, S.[1], Schmidt, W.E.[1], Gabriel, D.[2], Sauvage, T.[3] and Krayesky, D.M.[4]

1. Department of Biology, University of Louisiana at Lafayette, Lafayette LA 70504-2451, USA
2. Centro de Investigação em Biodiversidade e Recursos Genéticos (CIBIO) – Universidade dos Açores, Ponta Delgada, Portugal
3. Department of Biology, University of Louisiana at Lafayette, Lafayette LA 70504-2451, USA
4. Department of Biology, Slippery Rock University, Slippery Rock, PA 16057, USA

In the northwestern Gulf of Mexico beds of rhodoliths and unconsolidated rubble are associated with unique offshore deep bank habitats, the salt domes or diapirs that are peculiar to that part of the northern Gulf. In contrast to being mainly composed of crustose corallines (or foraminifera), rhodoliths in the NW Gulf of Mexico at depths of 40-85 m are instead dominated by red algal crust-forming members of Peyssonneliaceae and Rhizophyllidaceae. These rubble habitats were prominent features harboring the highest known seaweed diversity in the NW Gulf prior to the April 2010 BP oil spill, and rhodoliths were completely or partially covered by a great diversity of epilithic red, brown and green benthic seaweeds, many of which were foliose. Results from post-spill expeditions indicate that seaweed diversity in all dredged sites was severely depressed or altogether absent relative to pre-spill sampling. “Bare” or partly algal-denuded unconsolidated rubble brought back from post-spill cruises as “live rocks” have been maintained in 20-gallon tanks and gradually became covered by a suite of red, green and brown seaweed germlings that to this day continue to grow to adult size revealing biodiversity repressed in the NW Gulf at the time of the post-spill sampling. Many of these species currently growing and reproducing in our tanks had not been observed in the field during our pre-spill samplings. Testing for algal spore presence in the seawater used to partly fill the tanks based on a PCR approach tested negative, providing evidence that the intrinsic source of the propagules is the “bare” rubble retrieved. The rate of algal succession is being documented by digital photography and their taxonomic identity is confirmed by ongoing molecular barcoding and morphological evidence. The implications of these exciting results indicating that undetected algal propagules, spores and endolithic filaments collected along with the “bare” rocky substrata have been triggered to germinate, grow, and reproduce under laboratory conditions that exclude herbivores, are far-reaching.