

Distributions of cold-seep bivalve larvae in the Western North Atlantic, Caribbean, and Gulf of Mexico

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Between 2012 and 2015, we used MOCNESS tows and the SyPRID plankton sampler on AUV Sentry to collect planktonic invertebrate larvae at depths ranging from the surface to 4000m above 19 seeps on the Barbados Accretionary Prism, the West Florida Escarpment, the Louisiana and Texas Slopes, and the Continental Margin of the U.S. East Coast. All invertebrate larvae (n = 5133) were sorted into morphotypes immediately after collection and representative bivalve larvae were identified later by barcoding and imaged with SEM. Seep mussels identified from the plankton included *Bathymodiolus childressi*, *B. brooksi*, *B. heckerae*, *B. boomerang*, *B. mauritanicus*, *Tamu fisheri*, *Idas macdonaldi*, *Acesta oophaga*, *Abyssogena southwardae*, *Laubiericoncha myriami*, *Vesicomya cordata*, and other vesicomys. Densities in the water column were very low. The bathymodiolins were generally not distinguishable by external morphological characters, but multiple species sometimes co-occurred in the same water masses. In some cases, larvae were found many thousands of kilometers from the nearest known adult populations; an example is *B. boomerang*, a species from Barbados that was sampled off New England. Larvae of the vesicomys *Abyssogena southwardae* were collected more than 2000 m shallower than known adult populations on the Florida Escarpment. Larvae with sequences corresponding to the West African *Bathymodiolus mauritanicus* were found 4000 m above the bottom off Barbados, supporting an earlier hypothesis that this is an amphi-Atlantic species, probably with long-distance dispersal capabilities.