CYANOBACTERIA OF THE SALTON SEA

A. Michelle Wood, Scott Miller, and Richard Castenholz
Dept. of Biology, University of Oregon, Eugene, Oregon 97403

Aquatic environments like the Salton Sea represent extreme environments that mimic, in some ways, the extreme environments present in the early earth. The high concentrations of sulfur, for example, are toxic to many photosynthetic micro-organisms but can be tolerated by cyanobacteria. Cyanobacteria are among the most primitive oxygen-evolving photosynthetic organisms; they are more closely related to heterotrophic bacteria than higher plants. As a group, they are extremely diverse in the Salton Sea with most genera of common marine cyanobacteria represented by at least one species. We have been able to create pure cultures of many of these forms and have focused special attention on those which form long filaments. This type of cyanobacteria is found in large, slimy, visible mats along the shoreline at certain times of year; our observations suggest that these mats form near the bottom, in layers where hydrogen sulfide concentrations are high.

THE BENTHIC INVERTEBRATES OF THE SALTON SEA: DISTRIBUTION AND SEASONAL DYNAMICS

Paul M. Detwiler, Marie M. Coe, and Deborah M. Dexter
Center for Inland Waters and Department of Biology, San Diego State University.

Objectives:

This study focuses on the distribution and seasonal abundance of the benthic (bottom-dwelling) invertebrate species which serve as a major food source for fish and many types of birds in the Salton Sea. Its purpose is to document the diversity of species and their abundance within three major habitats: the sea bottom at depths of 2–12 m, the shoreline barnacle shell sand, and on rocky shorelines.

Methods:

We surveyed each habitat bimonthly throughout 1999. We sampled the offshore sediments using a grab off of our research boat. The grab removes a 225 cm2 sample of the sea floor, which is rinsed through a screen. Animals retained on the screen are preserved for later sorting and enumeration back in the lab. We sampled the Sea bottom along 3 transects, each containing 6 stations at depths of 2, 4, 6, 8, 10, and 12 m, collecting a total of 320 samples. We sampled the shoreline sand at 3 locations on the east side of the Sea using a coring device which removed the top 10 cm of a .01 m2 area for a total of 54 samples. Finally, we scraped off all the living material from within 60 10 x 10 cm squares on both barnacle- and algae-covered rocks to determine the abundance of invertebrate species in this habitat.

Important Results:

Ours is the first scientific survey of the invertebrate life in the Salton Sea since 1956, and we have discovered 4 species of worms new to the Sea. The macroinvertebrate community now consists of 5 worms, 2 amphipod crustaceans, and 1 barnacle. The pileworm *Neanthes succinea* is the key food chain organism for fish and birds, and is the dominant species on the sea bottom between depths of 2-12 m. However, its abundance varies greatly over the year, due to the seasonally decreasing oxygen levels in the water column. In spring, the pileworm was abundant at all depths and locations sampled, but disappeared by September from all sediments deeper than 2 m, and from the shoreline sand habitat. In contrast, densities of all invertebrate species increased throughout the year on the rocky shoreline, which harbors the highest numbers of organisms. In this habitat, *Neanthes* was present in densities of up to 85,540/m2, and the crustacean *Gammarus mucronatus* was seen at densities of up to 125,780/m2. This demonstrates the importance of the rocky shoreline both as a refuge for *Neanthes*, and as a habitat that should be maintained to ensure the availability of these food organisms for fish and birds.