

MICROBIAL COMMUNITIES IN THE DEEP HYPERSALINE ANOXIC BASINS OF THE EASTERN MEDITERRANEAN SEA

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Deep hypersaline anoxic basins (DHABs) in the eastern Mediterranean sea are extreme environments characterised by oxygen absence, high salinity and high pressure; the brine of the DHABs has high density and the steep chemocline at the seawater-brine interface acts as a particle trap which can be inhabited by diverse microorganisms.

We studied the microbial diversity of four DHABs, Urania, Bannock, Discovery and L'Atalante, sampled during the R/V Urania cruise in August 2001. The brines and the chemocline confirmed to host an higher number of microorganisms respect to the overlying deep seawater, as shown by total cell counts performed with 4,6-diamidino-2-phenylindole and by quantification of total DNA: in the chemocline of all the DHABs (ranging from -3400 to -3700 m) total microorganisms per litre were one order of magnitude higher ($1.6 \pm 1.2 \cdot 10^9$) than in the brines ($7.4 \pm 5.6 \cdot 10^7$), which were slightly higher than the overlying seawater ($3.3 \pm 1 \cdot 10^7$) at a depth of -3300 m. DNA extraction yields were 0.2 ± 0.03 ng/l in the deep seawater, 16.5 ± 4.3 ng/l in the chemocline, and 0.4 ± 0.3 ng/l in the brines.

The diversity of microbial communities inhabiting DHABs was analysed with different DNA-fingerprinting methods based on the amplification of 16S rDNA (ARDRA, DGGE and SSCP) or the 16S-23S rDNA spacers (ARISA and ITS-HHP) using primers specific for eubacteria or archaea. Brines and chemoclines of the different DHABs showed a wide diversity with specific bands not present in the overlying seawater, and bands specific for each DHABs. *BIODEEP is FP5 EC Project (Contract EVK3-2000-22057). <http://www.geo.unimib.it/BioDeep/Project.html>