Geophysical Research Abstracts, Vol. 7, 08309, 2005
SRef-ID: 1607-7962/gra/EGU05-A-08309

Sulfate reduction in marine cyanobacterial mats: Old concepts, new ideas

Yehuda Cohen

Microbial and Molecular Ecology

Life Sciences Institute

Hebrew University of Jerusalem

Jerusalem 91904, Israel

Yehucoh@vms.huji.ac.il

Surface layers of marine cyanobacterial mats exhibit marked diurnal changes in oxygen availability - from supersaturation at midday to anoxia at night. Various diurnal cycle measurements of oxygenic photosynthesis, aerobic respiration and sulfate reduction show that these processes are seemingly closely interrelated. Both light and oxygen are available only at daytime while sulfate is available throughout the diurnal cycle. Can facultative oxygen utilizing sulfate reducing bacteria thrive under these conditions? Two-dimensional mapping of sulfate reduction show sulfate reduction activity well within the oxygen supersaturated microenvironment. Microscale distribution data of sulfate reducing bacteria indicate both high biomass and high activity of sulfate reducing bacteria at the surface zone. Attempts to isolate representatives of this sulfate reducing bacterial group yielded the physiological characterization of *Desulfovibrio oxyclinae*. It was found to be capable of growing by the use of oxygen and in the absence of sulfate when grown in a chemostat together with the aerobic heterotroph *Marinobacter sp*. This organism is probably not the dominant type at the surface of cyanobacterial mats. The characteristic of truly facultative aerobic sulfate reducing bacteria requires in addition the need to cope with exposures to reactive oxygen species.