

## **Microbial activity in deep subsurface sediment of a tropical bay**

ENRICH-PRAST, ALEX<sup>1,2</sup>, LOMSTEIN, BENTE<sup>3</sup>,  
CAMPELLO, RENATO<sup>4</sup> AND CAETANO, CRISTIANE<sup>1</sup>

<sup>1</sup>Department of Ecology, Federal University of Rio de Janeiro, Brazil, aeprast@biologia.ufrj.br

<sup>2</sup>Department of Environmental Change, Linköping University, Sweden, alex.enrich.prast@liu.se

<sup>3</sup>Department of Bioscience, Aarhus University, Denmark, bente.lomstein@bios.au.dk

<sup>4</sup>Department of Geosciences, Federal University Fluminense, Brazil, rccordeiro@geoq.uff.br

A sediment core of 4m depth covering a timescale from present to ~5.400 years ago was collected from Guanabara Bay, Brazil and it was analyzed in order to evaluate its microbial activity. Sediment was analyzed for some aminoacids, total hydrolysable amino sugars, vegetative cells and endospores numbers, and amino acid enantiomers (D- and L-form) of aspartic acid. Diagenetic indicators were applied to evaluate the degradation status of the sedimentary organic matter. The contribution of amino acids to total organic carbon and the ratios between specific amino acids and their non protein degradation products indicated increasing degradation state of the organic matter with sediment depth and age. Microbial necromass was the dominant amino acid pool contributing with a mean of 99.1%. The turnover times of microbial necromass were in the range of 74 – 200 years and the turnover times of vegetative cells were in the range of 0.7 to 2.9 years. The microbial activity is low, being higher near the top of the core. The turnover times of the TOC pool increased with depth which indicates that TOC pool became progressively more refractory and unavailable to microorganisms with organic matter depth and age.